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NetWare Version 2.2

Using the Network

NetWare®

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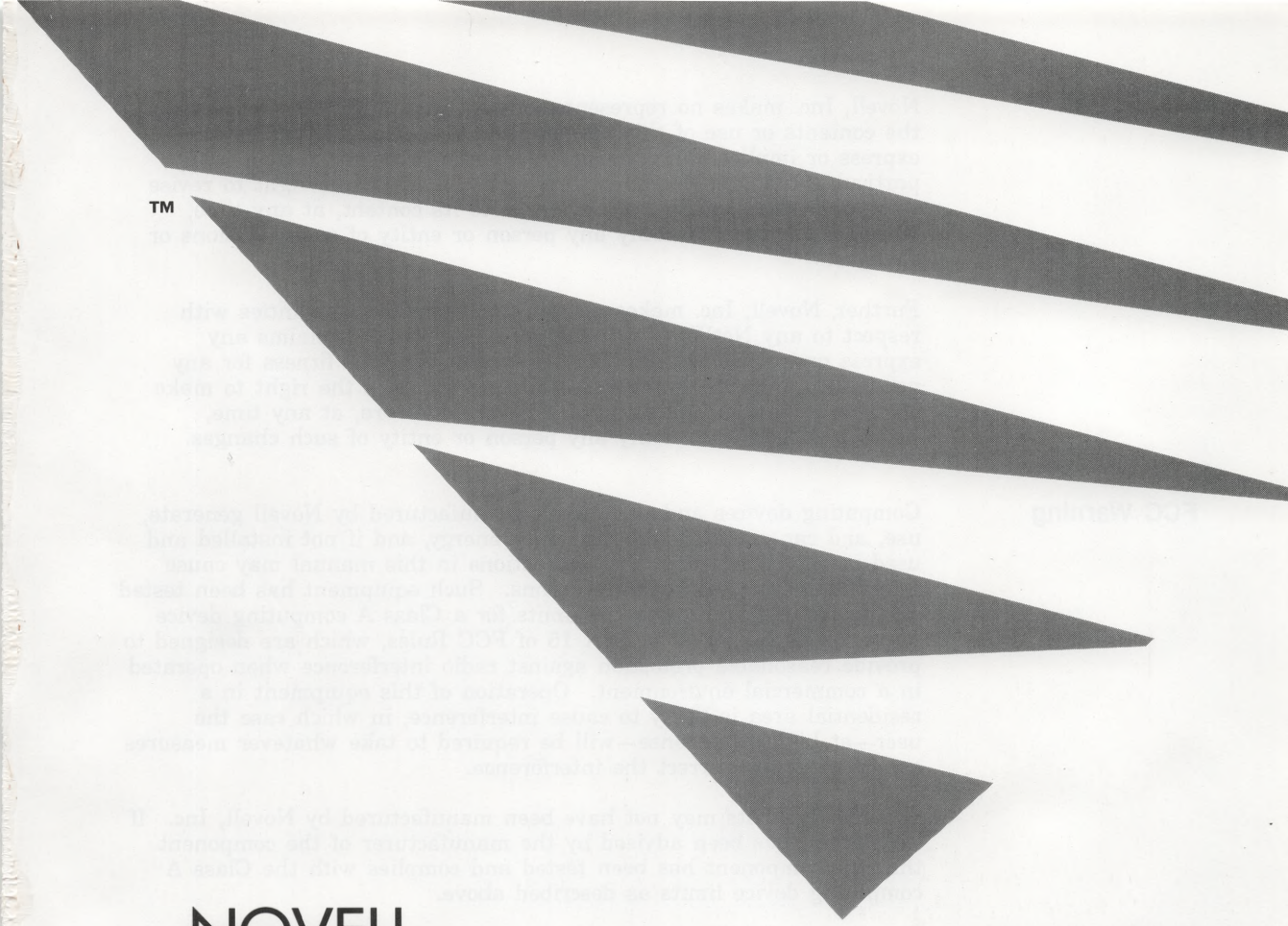

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How to use this manual

This manual should be used to continue setting up the network after the software installation and configuration instructions in *Installing and Maintaining the Network* have been followed. If you have not yet installed the network software, refer to *Installing and Maintaining the Network*, then return to this book. The instructions in this book will help you set up the network after the hardware and software have been installed.

For more information about the topics discussed in this manual, see *Concepts*. You will be referred to specific topics in *Concepts* as you work in the chapters of this manual.

For more information about the utilities discussed in this manual, see "Utilities reference," starting on page 245. You will be referred to specific utilities as you work in the chapters of this manual.

Manual organization

This manual contains information about setting up and using a NetWare network. The information is divided into three main parts:

- **Setup instructions.** The first nine tabbed sections tell you how to set up the network after it has been installed. Since every network is unique, you may not need to use all the information included in this part of the manual. Copy and use the "Network setup checklist" on the following pages as a setup guide. In the back of this manual is a set of worksheets you can copy and use to help you plan the setup of your network.
- **Task list / Quick path.** The tenth tabbed section of this manual is called "Task list / Quick path." This section provides tools for using utilities and commands at DOS workstations and at the file server console.
- **Utilities reference.** The last tabbed section of this manual is the "Utilities reference," which describes each of the console commands and the command line and menu utilities that you can use on a DOS workstation to work with the network.

Network setup checklist

Use the checklist on the following page as a guide for initial network setup.

☑	Task	Section	Pages
❑	Read file server management introductory information.	"Managing the file server"	5
❑	Prepare the file server for booting, boot the file server, and become familiar with that process.	"Boot the file server"	5-10
❑	If you are using VAPs or have a UPS, consider creating a SERVER.CFG file (optional).	"Customize booting with the SERVER.CFG file"	12-16
❑	Review progress to this point and see what's ahead.	"What to do after the server is up and running"	27-28
❑	Read the workstation introductory information.	"Managing DOS workstations"	29
❑	Check network cabling and board connections on all network stations (optional).	"Run COMCHECK"	29, 273-274
❑	Create workstation boot diskettes for all DOS workstations.	"Create workstation boot diskettes"	29-30
❑	If you have workstations that you don't want to boot from local disks, set up remote reset booting (optional).	"Set up remote reset workstation boot"	30-35
❑	Learn how to customize workstation booting (optional).	"Customize workstation booting"	35-38
❑	Learn how to use the SHELL.CFG file (optional).	"Customize DOS workstation configuration with SHELL.CFG"	43-52
❑	Read the introductory information about logging in and out.	"Logging in and out"	69
❑	Log in as user SUPERVISOR.	"Log in as SUPERVISOR"	69
❑	Set a password for user SUPERVISOR and create a SUPERVISOR-equivalent user.	"Set SUPERVISOR password"	70
❑	Go to the next section and read the introductory information about creating your network directory and file structure.	"Organizing and accessing files"	111

☑	Task	Section	Pages
❑	Review the directory structure that INSTALL created; plan and create the rest of the structure.	"Create the directory structure"	111-113
❑	Install application software on the network.	"Install applications"	113-114
❑	Plan and set up network security for directories and files.	"Assign file security"	114-115
❑	Plan drive mappings to include in login scripts and record them on the "Login Scripts Worksheet."	"Plan login script drive mappings"	116
❑	Read the introductory information about users and groups.	"Managing users and groups"	117
❑	Plan and create network users, their privileges, and their restrictions.	"Users"	117-126
❑	Plan and create groups of network users and their trustee rights.	"Groups"	127-128
❑	Run the SECURITY utility to check the network security you have created so far.	"Check security"	129
❑	Go back to the login section. Plan and create the system login script. Then plan and create user login scripts as required.	"Plan and create login scripts"	70-73
❑	Read the introductory information regarding network printing.	"Using core printing" or *Print Server* manual.	131
❑	Set up printing on your network.	"Set up your network for core printing" or the appropriate instructions in *Print Server.*	131-134
❑	Set up NetWare accounting on the network (optional).	"Managing accounting"	145-150

User Comments

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Managing the file server

This section tells you how to set up the file server after the network software has been installed. It tells you how to boot dedicated and nondedicated servers, and how to set up the AUTOEXEC.SYS and SERVER.CFG files.

Before setting up the file server using procedures in this section, you should have installed the network hardware and software as discussed in *Installing and Maintaining the Network.*

You should be familiar with the following topics found in *Concepts* before working with this section so that you can make the best use possible of the information found here.

Bindery
Boot files
Console
Disk Duplexing
File server
Hot Fix
Mirroring
Printing
TTS
UPS monitoring
VAPs

Boot the file server

After you have initialized the network hard disks and loaded the necessary NetWare system files onto the system hard disk, the file server is ready to be booted. If you have not completed these procedures yet, see *Installing and Maintaining the Network*; see "Installation" in the Master Index for page references. Once the file server is booted, you can log in to it from any attached workstation. (See "Logging in and out" on page 69 for more information on logging in from a DOS workstation.)

In this section you will:

1. Create a boot disk, either a floppy diskette or a bootable DOS partition on a hard disk.
2. Boot the file server.
3. Interpret boot screens.

4. Switch a nondedicated file server between DOS and console modes.

Create a dedicated file server boot disk

A NetWare v2.2 dedicated file server can be booted either from a bootable DOS floppy diskette or from a bootable NetWare partition on the system hard disk. You can boot from the system hard disk on any of the following types of file servers that have bootable system hard disks:

- IBM PC AT and compatible file servers
- IBM Personal System/2 Model 30 (286), 50, 50Z, 60, 70, and 80 file servers

If your dedicated file server can boot from a system hard disk, remove any diskettes from the server and boot the computer as you normally would. Now go to "The file server boot screens" on page 8.

If your dedicated file server does not have a bootable system hard disk, you will need to boot from a floppy diskette.

Use the following directions to create a boot disk for your file server. Some systems require special boot diskettes. If this is true in your case, check your installation supplement for instructions to replace these instructions.

1. Format the floppy diskette using the DOS 3.*x* or 4.*x* FORMAT command with the /S option.

2. Copy the operating system file NET$OS.EXE from the *OSEXE* diskette or the \OSEXE directory on the hard disk onto the boot diskette.

3. Create an AUTOEXEC.BAT file on the diskette using COPY CON or a text editor. The file needs to have only the following line:

   ```
   NET$OS
   ```

   If your file server is an IBM PS/2 model 50Z, and runs with zero wait states (and only if this is true), you must include a space and a Z after the NET$OS command.

After creating the file server boot disk, go to "Boot the file server" on page 8.

Create a nondedicated file server boot disk

A NetWare v2.2 nondedicated file server can be booted either from a floppy diskette or from a bootable DOS partition on the system hard disk. The bootable DOS partition, if you will be using one, should have been specified during installation, and created with the DOS FDISK command after you ran INSTALL.

You can boot from the system hard disk on any of the following types of file servers that have bootable system hard disks:

- IBM PC AT and compatible file servers
- IBM Personal System/2 Model 30 (286), 50, 50Z, 60, 70, and 80 file servers

If your dedicated file server does not have a bootable system hard disk, you will need to boot from a floppy diskette.

Use the following directions to create a boot disk for your file server and to prepare your DOS partition to boot NetWare. Some systems require special boot diskettes. If this is true in your case, check your installation supplement for new instructions.

1. If you want to boot from a DOS partition on your hard disk, you should have created a bootable DOS partition on the system hard disk using FDISK after running INSTALL. This partition will be the boot disk.

2. Format the floppy diskette or the DOS partition using the DOS 3.*x* or 4.*x* FORMAT command with the /S option.

3. Copy the operating system file NET$OS.EXE from the *OSEXE* diskette or the \OSEXE directory on the hard disk onto the boot diskette or partition.

4. Create an AUTOEXEC.BAT file on the diskette or partition using COPY CON or a text editor. The file needs to have the following lines:

   ```
   NET$OS
   NET3
   F:
   LOGIN
   ```

   If your file server is an IBM PS/2 model 50Z, and runs with zero wait states (and only if this is true), you must include a space and a Z after the NET$OS command.

   Make sure to substitute NET4 for NET3 in the batch file if you are using DOS 4.*x*.

After creating the file server boot disk, continue with "Boot the file server."

Boot the file server

To boot the file server, do the following:

1. If you are booting from a floppy diskette, insert the diskette into drive A.
2. Turn on (or reboot) the computer.
   - If you booted from a floppy diskette and this is a dedicated file server, then DOS will be unloaded by NET$OS and the network operating system will take over.
   - If you booted from the hard disk and this is a dedicated file server, then DOS will never be loaded.
   - If this is a nondedicated file server, DOS will remain loaded so that the NET*x* workstation shell can be loaded and you can log in.
3. See the following section for information about what you see on the screen when the server boots.

The file server boot screens

If you followed the proper boot procedure, the file server monitor will begin displaying information similar to that described below. (The information may not begin to appear for several seconds.)

If you are booting the file server from its system hard disk, you will first see a "File Server Cold Boot Loader" heading similar to the following:

```
Novell File Server Cold Boot Loader
(C) Copyright 1988  Novell, Inc.  All Rights Reserved.
OS Load Successful
```

As each hard disk volume is activated, or "mounted," a message similar to the following will be displayed on the screen:

```
Mounting Volume SYS
```

If any problems are encountered as the volumes are being mounted, an appropriate error message will also be displayed; for example, "Not enough memory to cache volume *xxxx*."

If the transaction tracking system is installed, the following message will appear:

```
Initializing Transaction Tracking System
```

The file server next checks the bindery and queues. A message similar to the following is displayed:

```
Checking Bindery
Checking Queues
```

Any problems detected in either of these two areas will be indicated on the screen.

Each LAN that you have attached to a network interface board in the file server is then initialized, as indicated by a message similar to the following:

```
Initializing LAN A
```

The file server screen then displays the version of NetWare that has been installed on the server, along with the related copyright information, in a format similar to the following:

```
Novell Dedicated NetWare V2.2
(C) Copyright 1983-1990 Novell Inc.
All Rights Reserved.
```

The file server date and time are then displayed, based on the internal clock that was programmed with the SETUP (or similar) utility for your file server hardware:

```
JANUARY 15, 1991 7:58:23 am
```

Any changes to the date or time must be made by either running SETUP again or by using the NetWare SET TIME console command (as described in "Utilities reference").

If you are booting a dedicated file server, a colon will appear on the screen below the date and time:

```
:
```

This colon is the network console prompt. You can enter network console commands at this prompt. DOS operations will need to be performed on a DOS workstation logged on to the file server; you cannot perform DOS operations on a dedicated file server. See "Managing DOS workstations" on page 29 for instructions on booting the DOS workstation.

If you are booting a nondedicated file server, the DOS prompt will appear on the screen below the date and time. This will probably be F>, depending upon what the AUTOEXEC.BAT batch file set it to. If the AUTOEXEC.BAT file contains the LOGIN command, enter the login name SUPERVISOR; see "Logging in and out" on page 69.

Note: The user SUPERVISOR (who always has a system-created account) can log in as soon as the file server is installed and booted. Other users, however, must have accounts created for them before they can log in. See "Managing users and groups" on page 117.

Your file server is now booted and ready for network use.

Switching the nondedicated file server to/from DOS

On a nondedicated file server you can switch between the console (file server) and the DOS process (workstation) modes. To do this, you must have already booted the NetWare nondedicated operating system in the file server.

1. Type the following command at the DOS prompt:

   CONSOLE <Enter>

   The network prompt, a colon (:), appears on the screen. You can now enter NetWare console commands (such as MONITOR and QUEUE). These commands are discussed in "Utilities reference" in this manual.

2. To switch back to the DOS process (workstation) mode and use the file server as a workstation, type the following command at the network prompt:

   DOS <Enter>

   The DOS prompt appears on the screen. You can now enter DOS commands, NetWare workstation commands, and run application programs.

Where to go from here

If you plan to run Value Added Processes (VAPs) on the file server, or if you have installed an uninterruptible power supply, you may want to go to "Customize booting with the SERVER.CFG file" on page 12 for special setup instructions. To continue with initial network setup procedures, go to "What to do after the server is up and running" on page 27.

Customize booting with the AUTOEXEC.SYS file

As supervisor, you can create an AUTOEXEC.SYS file to store console commands you want executed each time the file server comes up. This file is used generally to automate printer and queue commands.

If you are using the print server VAP for printing, you should not place printing commands in your AUTOEXEC.SYS file. These instructions assume that you chose to use core printing during installation. See **Core printing** and **Printing** in *Concepts* for a discussion of the difference between core printing and VAP printing.

You can create the AUTOEXEC.SYS file with the SYSCON utility or with a text editor. This file is stored in the SYS:SYSTEM directory. To create the file with SYSCON see the instructions below. You must be in DOS mode on a nondedicated file server or at a DOS workstation attached to the server.

Creating the file

To create an AUTOEXEC.SYS file, do the following:

1. At the DOS prompt, type

   SYSCON <Enter>

2. In the "Available Topics" menu, highlight "Supervisor Options" and press <Enter>.

3. In the "Supervisor Options" menu, highlight "Edit System AUTOEXEC File" and press <Enter>. The "System AUTOEXEC File" entry box is displayed.

4. Type a list of the printer and spooler mappings you want to be executed each time the file server comes up. Valid commands are listed in "Using core printing."

5. Add any additional console commands you want to be executed each time the file server comes up. Valid commands are listed in "Utilities reference."

6. Press <Esc> and then <Enter> to save the file.

You can modify the AUTOEXEC.SYS file at any time by completing these same steps. Use the Backspace key to delete commands, then type in the new mappings.

Printer commands

You will probably want to include printer commands in the AUTOEXEC.SYS file. See "Using core printing" on page 131 for instructions on setting up printing.

Other commands

In addition to printer and spooler mappings, you can save any other console command in the AUTOEXEC.SYS file.

For example, you might want to include the MONITOR command to automatically start the monitoring function. Or you could include the WATCHDOG command to clear inactive connections after a specified period of time.

For a complete description of console commands, see "Utilities reference" on page 245.

Sample AUTOEXEC.SYS file

The following is an example of commands that could be placed in an AUTOEXEC.SYS file.

```
PRINT 0 CREATE LPT1
PRINT 0 ADD QUEUE LASER
S[POOL] 0 [TO] [PRINTQ_0] LASER
MONITOR
```

Customize booting with the SERVER.CFG file

Each time the file server is booted, the NetWare operating system searches the SYS:SYSTEM directory for the SERVER.CFG text file. The SERVER.CFG file contains commands to load VAPs and configure a UPS.

Create the file

To create the file follow these instructions.

1. You must be in DOS mode on a nondedicated file server or at a DOS workstation attached to the server.
2. Log in to the file server as SUPERVISOR.

3. Map one of your drives to SYS:SYSTEM and make that your current drive so that the file is created in that directory.

4. Create the file by typing in the desired commands using COPY CON.

If you have entered any information incorrectly in the SERVER.CFG file, you see the following message when the file server boots:

```
Invalid Config Parameters
```

Check the SERVER.CFG file for incorrect information (such as an invalid type number or I/O address) or incorrectly entered information (such as misspellings or extra spaces). To correct errors, recreate or edit the file.

Commands to Include

You can enter any of the following commands in the SERVER.CFG file:

VAP WAIT xxx This command specifies the amount of time the file server waits before automatically loading the VAPs.

Replace *xxx* with the number of seconds (minimum 10, maximum 300) you want the file server to wait. If you do not select a time or if you enter an invalid time, the minimum value is assumed.

The following prompt is displayed when the file server boots:

```
To Abort Loading of VAPs, Press Any Key

Time Left to Abort: xxx seconds
```

If you press any key during the wait time, the automatic VAP loading will be aborted and you will see this message:

```
VAP Loading Aborted
```

UPS T[YPE] = x This command specifies which type of UPS monitoring hardware you are using with your UPS.

Replace *x* with the type number of the UPS monitoring hardware you are using in your file server. These are the numbers for the available types of UPS monitoring hardware:

UPS Monitoring Hardware	Type No.
Standalone UPS monitor board	1
Host bus adapter	2
SS keycard	3
Mouse port (PS/2)	4

(Although NetWare does not require the SS keycard for serialization, you can still use the keycard as your UPS monitoring hardware.)

For example, if you have installed a host bus adapter (such as a disk coprocessor board) for your UPS monitoring hardware, enter the following in your text file:

```
UPS TYPE=2
```

UPS IO = xxx This command specifies the I/O address of the UPS monitoring hardware.

Replace the variable *xxx* with the I/O address of the UPS monitoring hardware, according to the guidelines below:

- If you are using the mouse port for UPS monitoring (on an IBM Personal System/2 file server), you do not need to enter an I/O address in the SERVER.CFG text file.
- If you are using a standalone UPS monitor board, the I/O address on the board can be set to either 240h or 231h. (The I/O address you chose should be recorded on the "File Server Definition" worksheet in *Installing and Maintaining the Network*.) Enter this number on the line.
- If you are using an SS keycard for UPS monitoring, the I/O address is 230h. Enter this number on the line.
- If you are using a Novell disk coprocessor board (DCB) for UPS monitoring, the board's I/O address is factory-set according to the board's channel number. The factory-set I/O address covers an 8-byte range, with the UPS monitoring I/O address located 6 bytes above the base I/O address. The UPS I/O addresses for each channel are listed below:

  Channel 1 UPS I/O=346
  Channel 2 UPS I/O=34E
  Channel 3 UPS I/O=326
  Channel 4 UPS I/O=32E

  The addresses all use hexadecimal numbers; you do not need to enter an "h."

  If you are using another type of host bus adaptor (HBA), consult that board's documentation.

For example, if you were using a Channel 1 disk coprocessor board for UPS monitoring, you would type the following line in the text file:

```
UPS IO=346
```

UPS D[OWN] = xxx This command specifies the UPS down time, which is the number of minutes users have to log out of the file server after the UPS begins supplying power and before the operating system brings down the file server.

Replace the variable *xxx* with the number of minutes of down time you want for your UPS. The down time must be at least 1 minute, but less than 64,800 minutes (45 days). If you do not specify a down time in the SERVER.CFG file, the system will assume the default down time of three minutes.

Enter a down time that will give users enough time to log off the system, but that will not unduly drain the UPS battery.

If you specify a down time that exceeds the UPS battery life, the operating system will bring down the file server within one minute after it receives the "battery low" signal from the UPS. If you specify a down time that is too long and the power goes down more than once in a short period of time, your battery may not be fully charged when it begins supplying power to the system the second time.

In estimating the life of your UPS battery, consider how many pieces of hardware will draw on the battery. A battery that is supplying power only to a file server will last longer than a battery that is supplying power to a file server and a disk subsystem.

For example, if you want the UPS to supply power for five minutes, and give users that long to log out before the file server goes down, enter the following in your SERVER.CFG text file:

```
UPS DOWN=5
```

UPS W[AIT] = xxx This command specifies the UPS wait time, the number of seconds you want the UPS to wait after supplying power before signaling the file server to notify users that the power is off.

It is neither necessary nor desirable to notify users each time there is a short power fluctuation. However, if the power is off for more than a few seconds, users should be notified so that they can log out.

Replace the variable *xxx* with the wait time you want for your UPS. The wait time must be between 15 seconds and 300 seconds

(5 minutes). If you choose not to specify a wait time in the SERVER.CFG file, the system will assume the default wait time of 15 seconds. The wait time must be less than the down time.

For example, if you want the UPS to wait for the power to be off at least 20 seconds before users are notified, enter the following line in the text file:

```
UPS WAIT=20
```

If you have installed the UPS hardware and set up the SERVER.CFG file correctly, the following message appears on the screen when the file server boots:

```
UPS enabled on <servername>
```

This message requires no action on your part; it simply indicates that the UPS will be able to function properly should it be needed.

Where to go from here

If you are setting up the network for the first time, go to "What to do after the server is up and running" on page 27.

Fine-tune your file server's performance

Since no network is completely trouble free, you may need to solve some network problems from time to time.

This section includes tips on managing your file server and its resources. These tips are not intended to be exhaustive, but will get you started in a routine maintenance schedule that will keep the file server and its resources functioning effectively.

Many of the suggestions are for file servers with 30 or more users, multiple hard disks, and multiple network boards. If you have a simple system of one network board, one internal hard disk, and fewer than 10 users, you probably need to perform only the first maintenance task suggested in each section.

When you encounter errors on the file server console monitor or at a workstation, see the alphabetical listing of error messages in "System Messages" in *Installing and Maintaining the Network.*

Record keeping

With proper record keeping, the job of maintaining your network can be relatively simple. We suggest you keep records of the following items:

- **All hardware purchases.** Record all warranties, purchase receipts, and information such as serial numbers of equipment, and companies to contact for replacement parts or service for hardware. Also keep a list stating where those things have been filed. Register your operating system with Novell.
- **Software and manual purchases.** Know where they are located. Keep a record of the upgrade policy for each application.
- **All hardware installed in the file server.** Record all configuration information such as memory boards, hard disks, network boards, and disk adapters and subsystems. See the "External Hard Disk" and "File Server Definition" worksheets in *Installing and Maintaining the Network*. If you have a disk subsystem, make a diagram showing the addressing of the hard disks and controllers.
- **Workstation setup.** Record all configuration information such as network boards, cables, workstation files (IPX.COM, NET*x*.COM), and DOS version. See the "DOS Workstation Configuration" worksheet in *Installing and Maintaining the Network*.
- **All cable connections.** Update sketches and records to reflect any changes.
- **Security setup chart.** See the "Trustee Directory Security" worksheet and the "Trustee File Security" worksheet in this manual.
- **Applications.** Record how the applications have been set up and how users access the applications. See the worksheets in this manual. Include such things as mappings, rights, command codes, and batch files.
- **Login scripts.** Keep a hard and soft copy of the system login script file (NET$LOG.DAT) in the SYS:PUBLIC directory. On the hard copy, record the purpose of the commands.
- **System errors encountered.** Record how those problems have been solved. Then the next person to encounter them has a place to begin in solving the problem.
- **Changes made on the system.** Record information used when creating a new user or moving a workstation. Then problems that occur in the system can be retraced.

Disk maintenance

NetWare has many features that help protect your data from corruption or loss. Hot Fix, mirroring, and duplexing all help, but an application could still corrupt the data files, or two mirrored hard disks could fail at the same time.

For maximum security against loss of data, do the following:

1. Regularly back up the data on your hard disk. See **Backup** in *Concepts* or "NBACKUP" in this manual.

2. Check the status of each hard disk at least weekly using the FCONSOLE and SYSCON menu utilities. An increase in redirected blocks can indicate that a hard disk may need to be repaired or replaced. You can view the number of redirected blocks with the DISK command at the file server console.

   Potential disk failure is sometimes preceded by a sudden increase in the number of "Used" blocks. Back up any disk that shows an increase in the number of "Used" blocks. When the number of "Free" blocks is less than 40, the Hot Fix statistics should be monitored daily, and the disk should be backed up daily. Repair or replace the disk before Hot Fix uses all the "Free" blocks. When all free blocks are used, Hot Fix is disabled and volumes are dismounted.

3. Use SYSCON to scan the file server error log at least weekly. The log is where warning messages displayed on the server console are recorded. If you suspect problems, check this log on a daily basis.

Memory maintenance

If you monitor how fast available memory is used by growing resources, you can plan for future needs. We suggest that you monitor the following statistics on a regular basis:

- Cache buffers
- Dynamic memory pools
- File service processes
- Communication buffers

Cache buffers

Cache buffers are used to store frequently used files for fast access. The need for cache buffers will naturally increase as you add hard disks to the file server, as the number of files and their size increase, and as the number of users increases. The number of buffers you need depends on your system (the number of users and the tasks that they are performing). The optimum number of cache buffers is between 800 and 1,000; more can be used but do not add much to the system.

When users request more files than the file server is able to cache, the performance of the file server decreases. Read and write requests have to be read from, or written to, the hard disk (a process that is considerably slower than reading from, or writing to, memory).

You can view the number of cache buffers with FCONSOLE (select "Statistics" and then "Summary"). To determine if your file server has run out of available cache buffers, complete the following steps:

1. In FCONSOLE, select "Statistics" and then "Cache Statistics." View "Thrashing Count" in the "Cache Statistics" window of FCONSOLE. The "Thrashing Count" statistic should be near zero.
2. Divide the count by the number of days the file server has been up.
3. If the number is not below 1, add more memory to the file server.

   If the "Thrashing Count" is above zero, add memory until the "Thrashing Count" is zero or your file server has 12MB of memory.

   If 12MB of memory does not improve file server performance and the "Thrashing Count" is still high, then you should consider either installing another file server to share the network load (users and applications), or upgrading to NetWare v3.x.

Dynamic memory pools

Dynamic memory pools are temporary buffers for service requests, open files, file and record locks, file server and router information, and directory mappings. Simple systems will probably not run out of dynamic memory.

You can view memory statistics with FCONSOLE (select "Statistics" and then "Summary").

1. **Check Dynamic Memory 1.** Dynamic Memory 1 memory is used for temporary buffers while a file service request is being processed. The size of this pool is set by the operating system. If the "Peak Used" figure reaches the maximum, complete one or more of the following:
   - Remove one or more drivers
   - Reconfigure the driver to use smaller packet sizes if possible.
   - Install an additional file server.
   - Upgrade to NetWare v3.x.

2. **Check Dynamic Memory 2.** Dynamic Memory 2 memory is used to keep track of open files, file locks, and record locks. The current size of the pool is the number of open files. You can set the maximum size of this pool when you install the operating system. If the "Peak Used" figure reaches the maximum, use INSTALL -M to add to this pool and reconfigure the operating system.

3. **Check Dynamic Memory 3.** Dynamic Memory 3 memory is used to track file server and routing information. The size of this pool is set by the operating system. If the "Peak Used" figure reaches the maximum, you will need to reduce network traffic through the server by installing a network backbone to isolate local traffic and improve response time, or upgrade all the file servers to NetWare v3.x.

4. **Check Dynamic Memory 4.** Dynamic Memory 4 memory is used for mapping directories. The size of this pool is set by the operating system. If the "Peak Used" figure reaches the maximum, complete one or more of the following:
   - Have fewer users in applications that create temporary drive mappings. (The pool is large enough for 100 users to have 40 drive mappings each.)
   - Install an additional file server.
   - Upgrade to NetWare v3.x.

File service processes

The number of file service processes is set when the file server boots. Many installations will not need to make adjustments. However, very large file server configurations could take advantage of the following guidelines.

You can find the number of file service processes with FCONSOLE (select "Statistics" and then "Summary") or CONFIG at the file server console.

You should have at least three file service processes installed in the file server. An average of four is recommended; the maximum is 10. However, the file server may require more file service processes if more network boards are installed, cache memory is low, the CPU speed is slow, or only one controller handles all disk I/Os.

Do the following:

1. Enter FCONSOLE, select "Statistics" and then "LAN I/O Statistics." The "File Service Used Route" number increases each time the file server receives a request and a file service process is not free to service the process.

2. Compare the "File Service Used Route" against the "File Service Packets" found on the "File Server Statistics Summary" screen, before and after peak use. If the number is greater than 10% of the total, you need to improve performance by freeing up DGroup memory to allow the creation of another file service process. Do either Step 3 or Step 4.

3. Free DGroup memory to improve file service processes. Use one or more of the following methods.

   Core Printing. If you have configured your operating system for core printing services and have three or more printers attached to the file server, delete the printer from the console to see if this frees up memory. If it does, use a dedicated print server. The core printing processes use memory from the same pool (DGROUP) that file service processes are allocated from. The print server does not use memory from this pool.

   Use INSTALL -M to remove the core printing services. See *Installing and Maintaining the Network*. See the *Print Server* manual for instructions on installing the print server.

   Directory entries. Before you change any directory entries, back up the file server at least once and test the restore capabilities before you proceed. Free directory entries by

having users delete unnecessary files, directories, or trustee assignments, then decrease the maximum number of directory entries; DGroup usage is not reduced until the maximum is decreased.

Back up the file server and run BINDFIX to delete trustee assignments for deleted users.

If you reduce the maximum number of directory entries in the current volume, you could lose files.

Run FCONSOLE. Select "Statistics" and then "Volume Information." Subtract "Peak Directory Entries Used" from "Maximum Directory Entries." This figure represents the number of directory entries that can be deleted from the maximum.

If the figure is less than the following for each type of network board, reducing the number of directory entries will not free enough memory to allow the creation of another file service process buffer (which will allow the creation of another file service process).

Network board	Directory entries
Ethernet	35,856
ARCnet	26,640
Token-Ring	

Complete one of the following:

- If the figure is less than the minimum needed to create another file service process buffer, use other methods listed in this section to free memory for file service process buffers.
- If the figure is greater than the minimum needed to open another file service process buffer, down the file server and use INSTALL -M. Decrease the "Maximum Directory Entries." Do not decrease the maximum below the "Peak Directory Entries Used."

After you have rebooted the file server, restore any lost files.

Network boards. Install network boards that do not use DMA. Then use INSTALL -M to reconfigure the operating system.

Use LAN drivers that do not require large packet sizes.

Remove a network board from the file server and install an external router. Use INSTALL -M to reconfigure the operating system. See "Routers" in the Master Index for router installation page references.

Disk space. Split the disk space, applications and users between two file servers. You can also dismount seldom-used removable volumes.

File server. Add a new file server to the network and divide the network load between the two file servers.

NetWare v3.x. Upgrade to NetWare v3.x where the maximum number of file service processes can be configured.

4. Improve memory and I/O performance. Complete one or more of the following to increase cache performance.

   Memory. If the "Disk Requests Serviced From Cache" statistic on the "File Server Statistics Summary" screen is less than 93%, add more memory to the file server. Increasing the memory to 10MB increases the chances that requests will be serviced from memory. When a process can service requests from memory, the process can service more requests in a set time period because it does not have to wait for a disk I/O. You can reach a point of diminishing returns between 10MB and 12MB where memory is almost as cumbersome as disk I/O.

   CPU speed. Check the computer specifications or run diagnostics to check for the speed of the CPU. Make sure that the computer has been set for the highest speed. The faster the CPU runs, the faster the file server can service requests.

   If you have a 286 computer, upgrade to a faster clock speed (from 12MHz to 25MHz) or to a 386-based computer.

   Disk channel. Add a new third-party host bus adapter (similar to a disk coprocessor board), new hard disks, new controllers, and new drivers. Additional host bus adapters speed up the I/O process.

Communication buffers

Communication buffers are an area in the file server's memory set aside to temporarily hold data "packets" arriving from the network stations. Monitor the communication buffer statistics and the number of lost packets.

You can view the number of communication buffers with FCONSOLE; select "Statistics" and then "Summary."

1. **Routing statistics.** You should have at least 100 "Communication buffers," plus one for each workstation and one for each file server on your network. If the "Peak Used" is equal to the maximum, increase the number of communication buffers. Use INSTALL -M to add more communication buffers and reconfigure the operating system.

2. **Lost packets.** View the "LAN I/O Statistics" in FCONSOLE; select "Statistics" and then "LAN I/O Statistics." If either "Incoming Packets Lost Because Of No Available Buffers" or "Outgoing Packets Lost Because Of No Available Buffers" increments, the file server is losing packets. When the file server loses packets, file server performance decreases because retries are necessary. Use INSTALL -M to add more communication buffers and reconfigure the operating system.

Security maintenance

To make your system more secure you can use the security features of NetWare. Then set up a schedule to test your security. The more secure your system needs to be, the more frequently you should test it for violations. Use the SECURITY utility to test for general violations in the security setup, monitor your users' login habits, and monitor the effective rights in sensitive directories.

See "Managing users and groups" on page 117 for more information about setting up user and group security. See also "SECURITY" in "Utilities reference," on page 420.

Bindery maintenance

How much bindery maintenance you need to perform depends upon your file server.

- If you have installed a dedicated file server, the bindery is protected by TTS and needs little maintenance on a small and unchanging system.
- If you have installed a nondedicated file server and the file server does not have a UPS unit attached to it, a power failure can corrupt the bindery. Always keep a current copy of the bindery on diskette and be prepared to run BINDFIX.
- If the users on your file server are constantly changing, use the maintenance tips that follow to keep your bindery up to date.
- If you have 20 or more users, use the tips that follow to keep a current copy of the bindery (even if your bindery is protected by TTS). Recreating a bindery from poorly kept records is difficult and usually takes longer than creating it the first time.

Do the following to maintain the bindery.

1. Users. Use SYSCON or MAKEUSER to delete users who are no longer using the file server.

2. Trustee assignments. Use BINDFIX to delete trustee assignments for deleted users.

3. Backup. Keep a backup copy of the bindery files on diskette in a secure place. Record the SUPERVISOR's password and remember to change it once the bindery is restored.

4. .OLD files. Keep a current copy of the .OLD bindery files. To create these files run BINDFIX; see "BINDFIX" in "Utilities reference," on page 253. From the SYS:SYSTEM directory, copy the NET$BIND.OLD and NET$BVAL.OLD files to a diskette. Then delete the .OLD files from the SYS:SYSTEM directory. Record the SUPERVISOR's password and store the diskette in a secure place.

   If you lose your bindery and cannot restore it from a regular backup, copy the .OLD files into the SYS:SYSTEM directory. Run BINDREST. The .OLD files will be restored as the file server's bindery.

Note: If you ever have to use this method, you will have to change users' passwords. If the bindery files are very old, the users might not know which password to use, the current one or an old one.

Volume maintenance

How often you need to perform volume maintenance depends upon how valuable the data is, how much space you have for growth, and how fast available resources are being used. Select a regular maintenance schedule for the following items.

1. Backup. Use NBACKUP, the BACKUP VAP, or third-party software to regularly back up the data on the volume.

2. Space. Use CHKVOL and VOLINFO to monitor the growth of directories and files. By determining how fast a volume is growing, you can plan for additional hard disks or remove files and directories that are no longer used.

3. Directory entries. Use CHKVOL and VOLINFO to monitor the use of available directory entries. Back up the file server and run INSTALL -M to increase the number available.

4. FAT errors. FAT errors that occur while a volume mounts aren't necessarily bad. Keep monitoring them. If they prevent the volume from mounting, back up as much data as you can, check for bad hard disks and controllers, and run VREPAIR.

Backing up and restoring data

You can back up data on the file server using the NetWare NBACKUP utility, using a third-party program that is compatible with the version of NetWare you are running, or by installing and running the BACKUP VAP. Additional discussion on the reasons for backing up is found in *Concepts*.

Using NBACKUP

The NBACKUP utility is used to back up and restore data on file servers and local drives. NBACKUP is run from a workstation on the network; the workstation must remain dedicated to NBACKUP while the utility is running. NBACKUP also requires that you restore to the same type of system that you backed up from. You must, for example, restore to a NetWare v2.*x* system if you backed up a NetWare v2.*x* system.

NBACKUP allows you to backup to DOS or non-DOS devices. You can specify the file server and directories to back up, and other backup options.

Remember the following when using NBACKUP:

- Run the utility from a workstation on the network.
- Restore backups with the same type of system used to do the backup.
- Have SUPERVISOR rights to back up or restore an entire network; OR have [RF] rights to back up a single directory, and have [CEFMW] rights in the destination directory to restore.
- Choose either a DOS device or a non-DOS device for the backup.
- Use Macintosh file and directory name conventions (prefixed colon, case sensitive) when backing up or restoring Macintosh files.
- Make hidden and system directories visible before backing up by changing their attributes.

For instructions on how to use NBACKUP, see "NBACKUP" in "Utilities reference," on page 367.

Using third-party programs

If you use a third-party backup program to back up your data, refer to that documentation for instructions on backing up your data. The tool you choose must be NetWare-compatible.

When you back up files on the NetWare server you must make sure that the bindery and trustee assignment files are backed up. If these files are not backed up, restoring the complete backup will not result in a complete system. Most third-party backup software programs that are compatible with NetWare back up these files, but some do not. If the backup program that you are using does not back up these files, you should use NBACKUP.

Using the BACKUP VAP

The BACKUP VAP is used to back up on streaming tape. For instructions on the use of the BACKUP VAP, see the README file on the *BACKUP* diskette.

How to restore

To restore data from a backup, you must use the same program as was used to back up the data. See "NBACKUP" in "Utilities reference," on page 367, for instructions on restoring with NBACKUP, and your third-party documentation for instructions on restoring with a non-Novell backup tool.

What to do after the server is up and running

Before the new file server and its workstations can be used effectively in a NetWare network, you must complete the following tasks:

- Create workstation configuration files and workstation boot diskettes for each workstation. (See "Managing DOS workstations" on page 29.)
- Create appropriate login scripts. (See "Logging in and out" on page 69.)
- Create the necessary DOS directories on the file server. (See "Organizing and accessing files" on page 111.)
- Create the rest of the file server's directory structure. (See "Organizing and accessing files" on page 111.)

- Load application and data files into the appropriate directories on the file server. (See "Organizing and accessing and files" on page 111.)
- Create the users and groups that will use the file server. (See "Managing users and groups" on page 117.)
- Establish the network security for both users and directories. (See "Logging in and out" on page 69, "Organizing and accessing files" on page 111, and "Managing users and groups" on page 117.)

Instructions for completing the above tasks are found in the sections cited, in this manual.

As network supervisor, you should keep the following items on hand for future use in maintaining the network:

- The completed NetWare installation worksheets (so you have access to the information and know what parameters were selected during the NetWare installation process)
- The master shell diskettes created for the network workstations in "Managing DOS workstations."

Where to go from here

If you are performing an initial installation, continue with the next section, "Managing DOS workstations"

Managing DOS workstations

This section tells you how to set up and boot DOS workstations from a floppy disk or through remote reset, including running the COMCHECK utility. Workstation management is discussed, as well as the procedures for setting up SHELL.CFG and NET.CFG.

Before setting up workstations using procedures in this section, you should have installed the network hardware and software as discussed in *Installing and Maintaining the Network*, and booted the file server as discussed in "Managing the file server."

You should be familiar with the following topics found in *Concepts* before working with this section so that you can make the best use possible of the information found here.

Boot files
NetWare Expanded Memory Shell
NetWare Extended Memory Shell
NetWare workstation files
ODI
Remote boot
Security

Run COMCHECK

After installing all hardware for the network (network boards and cabling), run COMCHECK on each workstation and server to ensure that all stations on the network are able to communicate with each other. The COMCHECK utility checks only the hardware connection between stations; it does not check the network software or the file server. See "COMCHECK" in "Utilities reference," on page 273.

After you run COMCHECK to verify network connections, you are ready to begin creating workstation boot diskettes.

Create workstation boot diskettes

To create a workstation boot diskette, follow these steps:

1. Boot DOS on the workstation.
2. Format a floppy diskette using the DOS 3.*x* or 4.*x* FORMAT command with the /S option. This will become your workstation boot diskette.

3. Copy the workstation files IPX.COM and NET3.COM or NET4.COM from the diskette you prepared during installation for this workstation type onto the boot diskette.

   Make sure that the IPX you use matches the configuration of the network board in your workstation. See **NetWare workstation files** in *Concepts* for a description of each of these files, and whether you should be using other files.

4. Create an AUTOEXEC.BAT file on the diskette using COPY CON. The file should have the following lines:

   ```
   IPX
   NET3
   F:
   LOGIN
   ```

   Substitute NET4 for NET3 in the file if you are using the NET4.COM file.

   If you will be running applications that require the NetBIOS emulator, insert the following two lines between NET3 and F:.

   ```
   NETBIOS
   INT2F
   ```

5. Create a boot diskette for each workstation following the instructions in Steps 1 through 4.

If you have workstations that you don't want to boot from the local disk, follow the instructions found in the next section, "Set up remote reset workstation boot." If all of your workstations boot from local drives, go to "Customize booting" on page 35.

Set up remote reset workstation boot

Remote reset (also called "remote boot") allows workstations to boot from files on the file server's hard disk rather than from a boot diskette in a local drive or from a local hard disk. See **Remote boot** in *Concepts*. If you are planning to use diskless workstations, you must install remote reset.

Note: The diskless workstation must have a boot PROM installed on the network board, and the network board must be configured to use the PROM.

If all your workstations can boot from identical boot diskettes (if they all use the same DOS version, the same NetWare shell files, the same AUTOEXEC.BAT file), you need only one remote boot image file. Follow the instructions found under "Create a single remote boot image file."

If your workstations require more than one boot diskette, create multiple remote boot files, one for each type of workstation. This would be the case if workstations had different configurations (and so used different IPX files), ran different versions of DOS, or had different commands in the AUTOEXEC.BAT file. Follow the instructions found under "Create multiple remote boot image files."

Create a single remote boot image file

You must create remote boot image files on the file server's hard disk. These files are the equivalent of the files that would be found on a workstation boot disk; the workstation will boot from these files stored on the file server instead of from the files stored on the boot diskette.

1. Boot DOS on the workstation.
2. Format a floppy diskette using the DOS 3.*x* or 4.*x* FORMAT command with the /S option. We will refer to this as the boot diskette.
3. Copy the workstation files IPX.COM and NET3.COM or NET4.COM from the diskette you prepared for the workstation type during installation onto the boot diskette.

   Make sure that the IPX you use matches the configuration of the network boards in your workstations. See **NetWare workstation files** in *Concepts* for a description of each of these files, and whether you should be using other files.
4. Create an AUTOEXEC.BAT file on the boot diskette using COPY CON. The file should have the following lines:

   ```
   IPX
   NET3
   F:
   LOGIN
   ```

   Substitute NET4 for NET3 in the file if you are using the NET4.COM file.
5. Copy the AUTOEXEC.BAT file to the SYS:LOGIN directory and any other directories that may be defaults as specified by the login script. When the workstation boots, it changes the default

directory to SYS:LOGIN; the boot process will lose track of the AUTOEXEC.BAT file if copies are not placed where it can be found.

6. Use DOSGEN to create image files on the file server from the files on the boot diskette. For instructions on the use of this utility, see "DOSGEN" in "Utilities reference," on page 305.

Create multiple remote boot image files

You will need to create remote boot image files on the file server's hard disk. These files are the equivalent of the files that would be found on a workstation boot diskette; the workstation will boot from these files stored on the file server instead of from the files stored on the boot diskette. To create remote boot image files for each different workstation groups, follow the instructions below.

The naming conventions we use for the AUTOEXEC and remote boot image filenames are not required, but you should follow them for consistency until you are well enough acquainted with the process to do your own naming.

1. Group the workstations that will be booted remotely. Workstations in each group use identical boot files. You will need to create one boot file for each group.

2. Boot DOS on a workstation from the group.

3. Format a floppy diskette using the DOS 3.*x* or 4.*x* FORMAT command with the /S option. We will refer to this as the boot diskette.

4. Copy the workstation files IPX.COM and NET3.COM or NET4.COM from the diskette you prepared for this workstation type during installation onto the boot diskette. If you are using DOS 3.*x* on the workstation, use NET3.COM. If you are using DOS 4.*x*, use NET4.COM.

   Make sure that the IPX you use matches the configuration of the network boards in your workstations. See **NetWare workstation files** in *Concepts* for a description of each of these files, and whether you should be using other files.

5. Create a batch file for each group of workstations on the boot diskette using COPY CON. Instead of naming the batch file AUTOEXEC.BAT, give it a unique name such as AUTO1.BAT for group 1, AUTO2.BAT for group 2, etc. The file should have the following lines:

```
IPX
NET3
F:
LOGIN
```

Substitute NET4 for NET3 in the file if you are using the NET4.COM file.

6. Copy all of the AUTO*x*.BAT files into the SYS:LOGIN directory on the file server and any other directories that may be defaults as specified by the login scripts. When the workstation boots it changes the default directory to SYS:LOGIN; the boot process will lose track of the batch files unless copies are placed where they can be found.

7. Create an AUTOEXEC.BAT file on each diskette to call the batch file on that diskette. For example, the AUTOEXEC.BAT file on the diskette for group 1 would have a single line:

```
AUTO1
```

The boot process will execute AUTOEXEC, which will then execute AUTO1.

8. Use the DOSGEN utility to create an image file on the file server from the files on each boot diskette. Make sure to specify the name of a unique image file on the DOSGEN command line. This should be in the form of the name BOOTDSK*x*.SYS. For example, when you are using the floppy disk created for group 1, specify BOOTDSK1.SYS as the name for the image file. See "DOSGEN" in "Utilities reference," on page 305.

Repeat this step for each group of workstations, specifying a unique name for each different image file.

9. Determine the workstation node address for each workstation that will be using remote reset. This information is required for the remote reset boot file (BOOTCONF.SYS) that will be created in the next step.

If the workstation address is set manually, for example if you were using an ARCNET or RX-Net board, the workstation address can be determined from the DIP switch settings on the board. If the address is coded into the board's memory, such as

on Ethernet or Token-Ring boards, you will need to do the following to determine the address:

a. Boot the file server and type the following at the console prompt:

```
TRACK ON  <Enter>
```

b. Turn on one workstation only and watch the file server console screen. If the remote reset PROM on the workstation's network board is functioning properly, it will send a packet to the file server containing the workstation address when the workstation is powered on. This information will appear on the server console. See "TRACK ON" in "Utilities reference," on page 449.

c. Record the workstation information, turn off the workstation, and repeat this process with all other workstations, one at a time.

10. Create a remote reset boot configuration file (BOOTCONF.SYS) in the SYS:LOGIN directory. This file contains a list of all customized remote reset boot files, along with the network and node address of each workstation that needs to access them.

    If a customized boot image file is to be used, it must appear in the BOOTCONF.SYS file; if BOOTCONF.SYS exists and the image file is not referenced by it, the image file will not be used.

    Use COPY CON or a text editor to create the BOOTCONF.SYS file in the SYS:LOGIN directory. The line format is as follows:

    ```
    0x[network address],[node address]=[boot image file name]
    ```

    (The first character is the number 0, not the letter O.) For example, if you created a customized remote boot image file for a workstation with node address 10005, which was in group 2 on network 123ABC and used the BOOTDSK2.SYS image file, your BOOTCONF.SYS file would contain the entry

    ```
    0x123ABC,10005=BOOTDSK2.SYS
    ```

    The BOOTCONF.SYS file must contain an entry for each workstation using a customized boot image file you created. For example, a BOOTCONF.SYS file for two workstations using two customized image files might look like this:

    ```
    0x123ABC,10005=BOOTDSK2.SYS
    0x123ABC,33334=BOOTDSK3.SYS
    ```

If there are multiple file servers on one network, the image files, the BOOTCONF.SYS file, and the AUTOx files must be copied onto each file server so that the workstation can initially attach to any of the servers.

Customize workstation booting

By default, the IPX and NET*x* shell files require no parameters on the command line when they are loaded. You can, however, use command line parameters with these files if you want to load them using different options. If you are completing an initial installation, and you are interested in learning more, continue with this section. Otherwise, go to the section "Logging in and out" on page 69.

Include NETx parameters

Entering the NET3 command (or NET4 if you are using DOS 4.*x*) without any parameters on the command line will load the NET*x* shell into the workstation's memory. You can also enter a command line parameter with NET*x*. Valid parameters are as follows:

/I The Information parameter will display the shell type and revision level of the NET*x* file. Type

```
NET3 /I <Enter>
```

(or NET4 if you are using DOS 4.*x*) Information similar to the following will appear:

```
NetWare V3.02 - Workstation Shell for PC DOS V3.x
(C) Copyright 1990  Novell, Inc.  All Rights Reserved
```

/U The Unload parameter will unload the NET*x* shell from the workstation's memory. Type

```
NET3 /U <Enter>
```

(or NET4 if you are using DOS 4.*x*) Doing this will disconnect you from any servers to which you are attached. Information similar to the following will appear:

```
NetWare V3.02 - Workstation Shell for PC DOS V3.x
(C) Copyright 1990  Novell, Inc.  All Rights Reserved

You are being logged out of all servers...
Memory for resident shell has been released.
The NetWare shell has been unloaded.
```

PS=servername The Preferred Server parameter is used to specify which file server will be attached to. Type

NET3 PS=servername <Enter>

(or NET4 if you are using DOS 4.*x*) The workstation will attach first to the specified file server rather than to the first available file server.

/? The question mark parameter will display command parameters that can be used with the shell command.

```
NetWare V3.02 - Workstation Shell for PC DOS V3.x
(C) Copyright 1990  Novell, Inc.  All Rights Reserved

Usage : NET3 [<option>]
/?           Display shell usage
/I           Display shell version & type
/U           Unload the NetWare workstation shell from memory
/PS=<server> Specify a preferred server
```

Including IPX parameters

Entering the IPX command on the command line without any parameters will load the IPX interface file into the workstation's memory. You can also enter a command line parameter with IPX. Valid parameters are as follows:

/I The Information parameter will display the configuration of the IPX file. This specifies what hardware the IPX file is set up to use. Type

IPX /I <Enter>

Information similar to the following will appear:

```
Novell IPX/SPX v3.02 (900605)
(C) Copyright 1990 Novell Inc.  All Rights Reserved.

LAN Option: NetWare Ethernet NE2000 V1.03EC (891227)
Hardware Configuration: IRQ = 3, I/O Base = 300h, no DMA or RAM
```

/D The Display parameter will display valid hardware configurations that can be used with this IPX file. Type

IPX /D <Enter>

Information similar to the following will appear:

```
Novell IPX/SPX v3.02 (900605)
(C) Copyright 1990 Novell Inc.  All Rights Reserved.

LAN Option: NetWare Ethernet NE2000 V1.03EC (891227)
Hardware Options available:

* # 0.  IRQ = 3, I/O Base = 300h, no DMA or RAM
  # 1.  IRQ = 2, I/O Base = 320h, no DMA or RAM
  # 2.  IRQ = 4, I/O Base = 340h, no DMA or RAM
  # 3.  IRQ = 5, I/O Base = 360h, no DMA or RAM
  # 4.  IRQ = 2, I/O Base = 300h, no DMA or RAM
  # 5.  IRQ = 3, I/O Base = 320h, no DMA or RAM
  # 6.  IRQ = 5, I/O Base = 340h, no DMA or RAM
  # 7.  IRQ = 4, I/O Base = 360h, no DMA or RAM
  # 8.  IRQ = 4, I/O Base = 300h, no DMA or RAM
  # 9.  IRQ = 5, I/O Base = 320h, no DMA or RAM
  #10.  IRQ = 2, I/O Base = 340h, no DMA or RAM
  #11.  IRQ = 3, I/O Base = 360h, no DMA or RAM
```

An asterisk (*) denotes the default configuration. You can specify to use another configuration by using the **O#** option.

/O# The Option number parameter is used to specify that another hardware option should be used to boot the workstation. (Note that the first character is the letter "O," not the number "0.") For example, type

```
IPX /O1  <Enter>
```

on the command line to specify that you want to use option 1 instead of option 0 with this IPX file when booting. Note that you can change only the interrupt and base I/O settings using this option; if you want to use a different board you must create a new IPX using WSGEN. The number you specify should match the actual hardware settings on the board; if the settings do not match an error message will be returned.

The new IPX settings will be displayed.

```
Novell IPX/SPX v3.02 (900605)
(C) Copyright 1990 Novell Inc.  All Rights Reserved.

LAN Option: NetWare Ethernet NE2000 V1.03EC (891227)
Hardware Configuration: IRQ = 3, I/O Base = 300h, no DMA or RAM
```

/? The question mark parameter will display command parameters that can be used with the shell command. Information similar to the following will appear:

```
Novell IPX/SPX v3.02 (900605)
(C) Copyright 1990 Novell Inc.  All Rights Reserved.

Usage : IPX [<option>]
/?          Display valid parameters
/D          Display valid configurations
/I          Display version & type
/O#         Specify an option number
```

Load extended/expanded memory shells

In addition to the regular network shell files (NET3.COM and NET4.COM), there are also shells that support extended and expanded memory. Command line parameters for the shells are the same as for NETx.COM. Make sure that the files are present on the disk before you reference them on the command line or in your login batch.

- For extended memory, replace NETx.COM with XMSNET3.EXE or XMSNET4.EXE, matching your DOS version number. Do this on the command line or in all login batch files.
- For expanded memory, replace NETx.COM with EMSNET3.EXE or EMSNET4.EXE, matching your DOS version number. Do this on the command line or in all login batch files.

These shell files are found on the *WSGEN* diskette. See **NetWare expanded memory shell** and **NetWare extended memory shell** in *Concepts*.

Install ODI workstations

This section tells you how to set up and install a workstation that uses DOS ODI. See **ODI** in *Concepts*. See also the *NetWare ODI Shell for DOS* manual.

To install a DOS ODI workstation using a different protocol stack or network, use these instructions as a guideline. You will have to modify them to fit your situation.

To install DOS ODI workstations, you need the following:

- A working copy of the *WSGEN* diskette
- Enough DOS system diskettes to make master workstation diskettes and boot diskettes
- A disk (formatted diskette or hard disk) for each workstation to boot from

Prepare the workstations

1. Check to ensure that NetWare workstations have the following:
   - Up to 80KB of memory available to load the NetWare workstation files
   - At least 512KB of memory available to run application programs and NetWare menu utilities
2. Record the hardware information for the workstation on the "DOS Workstation Configuration" worksheet in *Installing and Maintaining the Network.*
3. Install all equipment for the workstation except the network board and cabling. Follow the hardware setup instructions in the user's guide for each computer.

Install the network board

1. Make sure that the network board conforms to your cabling topology (such as RX-Net or Ethernet) and that you have a DOS ODI LAN driver for the board. Drivers are located in the DOSODI directory of the *WSGEN* diskette.
2. Configure the network board using the following guidelines.

   Refer to the documentation that came with the network board to select and set the board configuration.

   Set the same configuration options on like boards for all your workstations. This reduces the number of master diskettes you will have to make.

   Choose the default configuration (usually option 0) if no other devices are using the settings. (Many network boards are factory set to the default.)

   Make sure the configuration option of each board is different from those of other boards or hardware installed in the computer (network boards, graphics boards, and modems, etc.).
3. Record the network board configuration settings on the "DOS Workstation Configuration" worksheet in *Installing and Maintaining the Network.* These settings can be helpful if you need to troubleshoot problems on your network later.
4. Insert the network board in the workstation. Make sure the workstation is turned off before installing the board. Seat the board firmly in any available slot and connect the correct cable.

Create the master ODI workstation diskette

The master workstation diskette contains copies of the files necessary to boot one type of workstation.

1. Create system diskettes by using the DOS FORMAT command with the /S parameter. Format the system diskettes using the correct version of DOS registered for each workstation on the network.

2. Set the attributes of the COMMAND.COM file on the floppy diskette to Read-only by typing

   ```
   ATTRIB A:COMMAND.COM +R  <Enter>
   ```

   This will prevent the file from being overwritten by another COMMAND.COM file of a different type later on. If the COMMAND.COM file is of the wrong type, the workstation will crash.

3. Copy the shell file you want from your NetWare *WSGEN* diskette to the master workstation diskette.

   - If you will use conventional memory in your workstation, use NET*x*.COM.
   - If you will use expanded (LIM 4.0 EMS compatible) memory, use EMSNET*x*.EXE.
   - If you will use extended memory (XMS 2.0 compatible) memory, use XMSNET*x*.EXE.

   See **Boot files** in *Concepts* for more information.

4. Copy the required workstation files from the DOSODI directory of the *WSGEN* diskette to the master workstation diskette. The following files are required to communicate with a NetWare server:

   - LSL.COM
   - If the diskette is to be used for remote booting you should also copy RPLODI.COM.
   - The LAN driver for your network board (NE2000.COM, for example).
   - The protocol stack file (IPXODI.COM, for example)

(Optional) Copy the following files from the DOSODI directory of the *WSGEN* diskette to the master workstation diskette.

- If your applications require NETBIOS.EXE, copy NETBIOS.EXE and INT2F.COM (optional).
- If your workstations are on a Token-Ring network with IBM routers, copy ROUTE.COM.
- If you are using either Token-Ring or PC-Net, copy LANSUP.COM from the DOSODI directory.

5. Create the CONFIG.SYS file. This file must have, at minimum, the following:
   - Lines to set the number of files (FILES=XX) and buffers (BUFFERS=XX). Both of these should be set to at least a value of 20; 30 may be required.
   - A line to load a memory manager if you are using such a program. See the user's guide for these programs for the appropriate commands to use. Most memory managers come with an installation program that will modify the CONFIG.SYS file for you. (You must temporarily change the attribute of the COMMAND.COM file back to Read Write; use -R.)

   If you are using the IBM LAN Support program you will need to run the DXMAID program. This program will either create a CONFIG.SYS file or modify the existing CONFIG.SYS file and place the appropriate commands in the file. It will also install the LAN Support drivers on your disk.

6. Put the executable files you selected into an AUTOEXEC.BAT file on the master workstation diskette. Use a DOS text editor to create the AUTOEXEC.BAT file; save it to the master workstation diskette. Load the files in the following order:
   - Link support layer
   - LAN drivers
   - Protocol stacks
   - The shell

   The following is a sample AUTOEXEC.BAT file; see your DOS manual for more ideas.

```
LSL
NE2000
IPXODI
NET3
```

Note: If you are using a 3C503 board and want to use DIX cabling, specify the connector setting at the command line by entering a D (DIX), as follows:

```
3C503 D
```

BNC, the default connector setting, does not require a command line parameter. For further details see the *NetWare Installation Supplement for 3Com EtherLink*.

7. Create a NET.CFG file on the master workstation diskette (optional). Usually, you do not need a NET.CFG file because the established defaults are adequate for your network. However, you might need to create a NET.CFG file if, for example, you are using a protocol other than IPX ODI. See "Customize ODI workstation configurations with NET.CFG" on page 52.

8. Label the master workstation diskette with the name of the LAN driver (such as "Master Workstation NE2000") and list the configuration settings on the diskette.

9. Log in to the network with the master diskette to ensure that the files you created, such as AUTOEXEC.BAT and CONFIG.SYS, can connect to the network.

Create the workstation boot disk

1. Copy the master workstation diskette files to each workstation boot disk.

   If you are booting from a floppy diskette, copy the files to that disk. If you are booting from a hard disk, copy the files to the root directory of that disk.

2. Personalize the boot disk with executable files and update the AUTOEXEC.BAT file (optional). If your AUTOEXEC.BAT file does not contain login commands, add

   ```
   F:
   LOGIN username
   ```

   You can substitute any valid username for SUPERVISOR. If the owner of the bootable files wants any other commands executed or programs loaded during the boot process, add those files to the boot area and make the appropriate changes to the AUTOEXEC.BAT file.

3. Label the workstation boot diskette (optional). If you are using a boot diskette, label it with the LAN driver, the configuration option, and the custom boot files included. This prevents the boot diskette from being confused with other diskettes.

4. Repeat Steps 1 through 3 for each workstation.

Now boot the ODI workstation and log in to the file server.

Customize DOS workstation configurations with SHELL.CFG

SHELL.CFG assigns parameters that modify the workstation's configuration. You should use the SHELL.CFG file to modify the way the workstation handles packets, print jobs, DOS versions, and search drives. If you are using DOS ODI drivers, see "Customize ODI workstation configurations with NET.CFG" on page 52.

Note: Certain applications such as databases, multitasking, electronic mail, or NETBIOS (involved in peer-to-peer communications or distributed processing) may require parameter values different from the default to function on the network.

Create the file

1. At the DOS prompt, create the SHELL.CFG file using COPY CON.

2. Include IPX.COM parameters or NETBIOS.EXE parameters as described on the following pages.

3. Copy the file to the workstation boot disk.

Include IPX.COM parameters

CONFIG OPTION=option This parameter overrides the configuration options chosen during the WSGEN or DCONFIG program. This parameter does not permanently change the IPX file, but changes only the configurations within the workstation RAM. Use this parameter to change the network board's configuration options temporarily without running WSGEN or DCONFIG (such as when you find a possible conflict and want to see if a new configuration option will solve the problem). If the configuration option must be changed permanently, reconfigure the IPX file through the WSGEN or DCONFIG program. The default is the option set during WSGEN or DCONFIG.

INT64 This parameter allows applications to use interrupt 64h to access IPX services. IPX now uses interrupt 64h to maintain compatibility with earlier versions of NetWare. If an application's documentation requests interrupt 64h or if you have an application that works on earlier versions of NetWare but hangs on NetWare v2.2, set this parameter to OFF. The default is ON.

INT7A This parameter allows applications to use interrupt 7Ah to access IPX services. IPX now uses interrupt 7Ah to maintain compatibility with NetWare v2.0a. If an application's documentation requests interrupt 7Ah or if an application works on earlier versions of NetWare but hangs on NetWare v2.2, set this parameter to OFF. The default is ON.

IPATCH=address This parameter allows any address in the IPX.COM file to be patched with any specified value.

IPX PACKET SIZE LIMIT=number Use this parameter to reduce the maximum packet size set by each LAN driver. Even though the LAN driver can send 16KB packets on the wire, the wasted memory for most operations may be unacceptable. The optimum packet size for Token-Ring drivers is 4160 bytes. For Ethernet, the optimum is 1500 bytes. Reduce the maximum packet size if you receive errors at the workstation. Not all drivers support this parameter.

Specify a value from 576 to 6500 (bytes). The default is the minimum of either 4160 or the size specified by the LAN driver.

IPX RETRY COUNT=number This parameter sets the number of times the workstation resends a packet. On networks that lose many packets, this retry count may need to be increased. IPX does not actually retry sending a packet. It uses this count to recommend the number of retries to the DOS shell and SPX. Increasing this number will cause a longer delay for some network functions, such as establishing a NetBIOS session or registering a NetBIOS name. The default is 20 retries.

IPX SOCKETS=number This parameter specifies the maximum number of sockets that IPX can have open at the workstation. An IPX-specific program, such as LANSchool from LANSystems Inc., may require more than the default number of sockets. The default is 20 sockets.

SPX ABORT TIMEOUT=number This parameter adjusts the amount of time, in ticks, that SPX will wait, without receiving any response from the other side of the connection, before it terminates the session. (There are 18.21 ticks per second on IBM PCs and compatibles.) The default is 540 ticks (about 30 seconds).

SPX CONNECTIONS=number This parameter specifies the maximum number of SPX connections a workstation can use at the same time. The default is 15 connections.

SPX LISTEN TIMEOUT=number This parameter adjusts the time that SPX will wait, without receiving a packet from the other side of the connection, before it starts requesting the other side to send back a packet assuring the connection is still valid. If SPX has not heard from the other side of the connection within this time, it will send packets to the other side asking for verification that the connection still exists. The timeout number is in ticks. (There are 18.21 ticks per second on IBM PCs and compatibles.) The default is 108 ticks (about 6 seconds).

SPX VERIFY TIMEOUT=number This parameter adjusts the frequency at which SPX sends a packet to the other side of a connection to inform it that its side is still alive. If no packets are being exchanged on the SPX connection by the software that established the session, SPX will send packets at regular intervals to make sure that the connection is still working. The timeout number is in ticks. (There are 18.21 ticks per second on IBM PCs and compatibles.) The default is 54 ticks (about 3 seconds).

Include EMSNETx.COM parameters

ENTRY STACK SIZE=number Use this parameter to ensure that the code residing in expanded memory is visible in the memory page frame. Many TSRs and other programs using expanded memory may need this parameter to be increased. The range is from 5 to 40. The default is 10.

Include NETx.COM parameters

ALL SERVERS=ON|OFF This parameter determines whether the "End of Task" signal is sent to all connected servers or only to those servers interacting with the task. When this parameter is turned on, the signal will be sent to all connected servers. When the parameter is turned off, the signal will be sent only to those servers the current process has interacted with. The default is OFF.

CACHE BUFFERS=number This parameter sets how many 512-byte buffers the shell will use for local caching of non-shared, non-transaction tracked files. Increasing the number of cache buffers can speed up the process of sequential reads/writes. The default is 5 cache buffers.

EOJ=ON|OFF This parameter specifies whether files, locks, semaphores, and so on will be closed automatically at the end of a job. The default is ON.

FILE HANDLES=number This parameter sets how many files a workstation can have open on the network concurrently. The setting for local files would be handled through the DOS CONFIG.SYS file. Some applications will ask for more than the default of 40 open files. If you receive many error messages that say the limit has been reached, increase the value of this parameter. The default is 40 open files.

HOLD=ON|OFF This parameter determines whether workstation files should be held open if they were accessed and then closed. If this parameter is on, all files opened by a program will be held open until the program exits. Older versions of certain applications that use FCB_IO may need this parameter set to on. The default is OFF.

LOCAL PRINTERS=number This parameter overrides the number of local printers on the workstation, which is normally determined by the BIOS. The BIOS defaults to a local printer for each parallel port. By setting the number of local printers to 0, you can prevent a workstation from hanging if the Shift and Print Screen keys are pressed while the workstation is not spooling and does not have a local printer.

LOCK DELAY=number This parameter determines the amount of time (in ticks) the shell waits before trying to get a lock. When many users access a file at the same time, the shell may be unable to gain access before its allotted wait time. If a workstation frequently receives error messages when a file is requested, increase the value of this parameter. The default is 1.

Note: This number is used for lock types that do not have a wait ability. For locks that have a wait ability, the wait time is calculated by multiplying this parameter number by the LOCK RETRIES number and then multiplying by two. The resulting number is the time, in ticks, the workstation will wait for a lock.

LOCK RETRIES=number This parameter specifies the number of times the shell attempts to get a lock on the network. This parameter is part of an equation that determines the total time the shell will wait when attempting to access a locked file. If a workstation frequently receives error messages when a file is requested, increase the value of this parameter. The default is 3.

LONG MACHINE TYPE=type_name This parameter (six characters or less) tells the shell what type of machine is being used each time

the %MACHINE variable is accessed. Its most noticeable use is to set the machine's search path to the correct version of DOS. (See **Long machine type** in *Concepts*.) The default is IBM_PC.

MAX CUR DIR LENGTH=number DOS defines the call to return 64 bytes of path. In the past, the shell has allowed 128 bytes to be returned. To provide compatibility both ways, this parameter is now configurable. The numeric range is from 64 to 255. The default is 64.

MAX PATH LENGTH=number DOS defines a valid ASCII string as 128 bytes, but this is insufficient for some network paths. This parameter can be changed to allow users to have paths of up to 255 characters. This path does not include file server or file names. The numeric range is from 64 to 255. The default is 255.

MAX TASKS=number This parameter configures the maximum number of tasks that can be active at the same time. Certain multi-tasking applications, such as Windows and DESQview, allow several programs to run at one time. If you use these applications and find that you are unable to start a new program, increase the value of this parameter. The range is from 20 to 128. The default is 31.

PATCH=number This parameter allows any address in the shell to be patched with any specified value. Use this parameter if a shell problem is announced and the solution is easily accomplished through changing some bytes within the programming. The patch parameter specifies the location of the bytes and inserts the correct values. This is not used unless specified.

PREFERRED SERVER=server_name This parameter sets the server that you will attach to and further ensures your connection to the network. Normally, the shell attaches to the nearest server. With this parameter set, the shell will attempt to poll up to five servers for an available connection. Then, if the server specified in the parameter has a connection available, the shell attaches to that server. If not, the shell attempts to connect to the specified server.

PRINT HEADER=number This parameter sets the size of the buffer that holds the information to initialize a printer for each particular print job. If you send print jobs with many instructions in the header (such as initializing a printer for an emulated mode, changing defaults, font selections, page length, or orientation) and the printer is not delivering all the requested attributes, increase the size of the print header. The range is from 0 to 255. The default is 64 bytes.

PRINT TAIL=number This parameter sets the size of the buffer that holds the information to reset the printer after a print job. If your

printer is not resetting after each print job, increase this parameter. The range is from 0 to 255. The default is 16 bytes.

READ ONLY COMPATIBILITY=ON|OFF This parameter determines whether a file marked Read Only can be opened with a read/write access call. Certain applications require this parameter to be on. The default is OFF.

Prior to NetWare v2.1, a program could open a Read Only file with write access without getting an error, though any attempt to write to the file would produce an error. To be compatible with DOS, Advanced NetWare v2.1 and above will not allow a Read Only file to be opened for write access. Setting the READ ONLY COMPATIBILITY to ON will cause the shell to revert to the old mode and allow the open request to succeed.

SEARCH MODE=mode This option determines if the shell will search the search drives. When an .EXE or .COM file requests an auxiliary file, it makes an open request through the operating system. The request may or may not specify the path for the operating system to find that file. If a path is not specified, the operating system searches the default directory.

If the file is not found, the NetWare shell enhances the search capabilities of the operating system by using the SEARCH MODE of the executable file to determine whether to continue looking for the file in the search drives.

Note: Specify the search mode that works correctly with the majority of your programs. To adjust individual programs, use the SMODE command line utility. See "SMODE" in "Utilities reference," on page 431.

The default search mode is 1. Valid search modes are as follows:

1 Search if a path is not specified.

2 Never search.

3 Search if a path is not specified and the request is only to read (not to write or modify) the file.

4 Reserved.

5 Always search.

6 Reserved.

7 Always search if the request is only to read the file.

The NetWare shell uses two criteria to determine whether to search the search drives. The first is whether or not the request to open a file specified a path. The second is whether or not the request to open the file was only to read the file or to read from and write to the file.

SET STATION TIME=ON|OFF The shell normally synchronizes the workstation time with the file server's time. If you don't want this to occur, set this parameter to OFF. The default is ON.

SHARE=ON|OFF This parameter allows a process to inherit all the resources of its parent process. A common need for this setting is a child process that should inherit the parent's file handles (or a copy), rather than have new file handles created for it. The default is ON.

SHORT MACHINE TYPE=type_name This parameter is similar to the LONG MACHINE TYPE, except it is used specifically with overlay files. This parameter (four characters or less) is used when the %SMACHINE variable is accessed. Examples of files using this parameter include the IBM$RUN.OVL file for the windowing utilities and the CMPQ$RUN.OVL file that uses a default black and white color palette for NetWare menus. The default is IBM.

SHOW DOTS=ON|OFF The NetWare file server does not have directory entries for dot (.) and double-dot (..) as DOS does. The shell is able to emulate these entries on FindFirstMatching and FindNextMatching DOS calls. The default is OFF. If you are using Microsoft Windows, set SHOW DOTS=ON.

SPECIAL UPPERCASE=ON|OFF The shell normally does no uppercase translation of ASCII characters above 128. Setting this parameter to ON causes the shell to call DOS for this translation. This is used for foreign language and special characters. The default is OFF.

TASK MODE=number This parameter determines the way the shell handles virtual machine task management. The default (2) will work with Windows 3.0. If you are using an earlier version of Windows or a third-party multitasking program, set TASK MODE to 1. If you are not using a multitasking program and want a little extra speed, set TASK MODE to 0. The default is 2.

Include NETBIOS.EXE parameters

NETBIOS ABORT TIMEOUT=number This parameter adjusts the amount of time in ticks that NetBIOS will wait, without receiving any response from the other side of a session, before it terminates

the session. Increase this value (along with NETBIOS RETRY COUNT and NETBIOS RETRY DELAY) if there are NETBIOS nodes across asynchronous lines or large internetworks. The timeout number is in ticks. (There are 18.21 ticks per second on IBM PCs and compatibles.) The default is 540 ticks (about 30 seconds).

NETBIOS BROADCAST COUNT=number This parameter, multiplied by the NETBIOS BROADCAST DELAY number, determines the total time it takes to broadcast a name resolution packet across the network. This number reflects the size of your network or internetwork. Increase this value if you can't attach to a gateway. This value is automatically reduced if NETBIOS INTERNET = OFF. Specify any value from 2 to 65535. The default is 4 when NETBIOS INTERNET = ON. The default is 2 when NETBIOS INTERNET = OFF.

NETBIOS BROADCAST DELAY=number This parameter, multiplied by the NETBIOS BROADCAST COUNT number, determines the total time in ticks it takes to broadcast a name resolution packet across the network. This value reflects the traffic of the network. The default is usually sufficient. Increase this value if the packet loss rate is higher or if the traffic is high; however, reduce the NETBIOS BROADCAST COUNT by a similar amount to maintain the same name resolution timeout value. This value is automatically reduced if NETBIOS INTERNET = OFF. Specify any value from 18 to 65535. The default is 36 when NETBIOS INTERNET = ON. The default is 18 when NETBIOS INTERNET = OFF.

NETBIOS COMMANDS=number The number of commands needed may vary among applications. The number may be set from 4 to 250. In most cases, the default setting of 12 is sufficient. However, if a NetBIOS command error 22 occurs, increase the parameter. Most applications will ignore this error and retry if a NetBIOS command is unavailable. In this case, increasing the number of commands would improve application performance. If you need to know specifics, contact the software application developers to find out how many commands they require. The default is 12.

NETBIOS INTERNET=ON|OFF If you are running NETBIOS applications on a single network with a dedicated file server, this parameter can speed up the delivery of name resolution and datagram packets when its value is set to OFF. If you are running on more than one network or LAN segment and will be communicating through bridges, or if you are running a non-dedicated file server, the value must remain at the default ON.

NETBIOS LISTEN TIMEOUT=number This parameter adjusts the time that NetBIOS will wait when no packets are received from the other side of a session before it requests a packet from the other side to assure the session is still valid. If NetBIOS has not heard from the other side within this time period, it will request that the other side respond immediately. NETBIOS will continue to send these requests to the other side at an interval specified by the NETBIOS VERIFY TIMEOUT command until the timeout specified by NETBIOS ABORT TIMEOUT has expired. The timeout number is in ticks. (There are 18.21 ticks per second on IBM PCs and compatibles.) Specify from 1 to 65535 ticks. The default is 108 ticks (about 6 seconds).

NETBIOS RECEIVE BUFFERS=number This parameter configures the number of IPX receive buffers that NetBIOS uses. Increase this value if software is oriented, where a many-to-one relationship exists, so that incoming burst traffic situations are common (for example, a 3270 gateway). Specify any value from 4 to 20. The default is 6 buffers.

NETBIOS RETRY COUNT=number This parameter affects NETBIOS session commands only. The retry count determines the number of times NETBIOS will resend a packet to establish a session with a remote partner. Adjust this value with the NETBIOS RETRY DELAY to vary the timeout on establishing NETBIOS sessions. This number reflects the size of the network or internetwork. Increase this value if you can't attach to a gateway. This value is automatically reduced if NETBIOS INTERNET = OFF. Enter values from 10 to 65535. The default is 20 when NETBIOS INTERNET = ON. The default is 10 when NETBIOS INTERNET = OFF.

NETBIOS RETRY DELAY=number This parameter affects NETBIOS session commands only. RETRY DELAY configures the delay in ticks between each packet that NetBIOS sends during an attempt to establish a session. It sends the request (and waits to send the next request) the number of times indicated by the NETBIOS RETRY COUNT. This value reflects the size of the network or internetwork you are working on. Increase this value if you can't attach to a gateway. Specify any value from 10 to 65535. The default is 10 ticks, about .5 seconds.

NETBIOS SEND BUFFERS=number This parameter configures the number of IPX send buffers that NetBIOS uses. Increase this value if software is oriented, where a many-to-one relationship exists, so that incoming burst traffic situations are common (for example, a 3270 gateway). Specify any value from 4 to 20. The default is 6 buffers.

NETBIOS SESSIONS=number This parameter configures the maximum number of virtual circuits that NetBIOS can support at the same time. Specify any value from 4 to 250. The default is 32 sessions.

NETBIOS VERIFY TIMEOUT=number This parameter adjusts the frequency at which NetBIOS sends a packet to the other side of a session to preserve the session. If no packets are being exchanged on the NetBIOS session by the software that established the session, NetBIOS will send packets at regular intervals to make sure that the session is still valid. The timeout number is in ticks. (There are 18.21 ticks per second on IBM PCs and compatibles.) Specify any value from 4 to 65535. The default is 54 ticks (about 3 seconds).

NPATCH=number This parameter patches any location in the NETBIOS.EXE data segment with any value. This is not used unless specified.

Customize ODI workstation configurations with NET.CFG

The NET.CFG control file contains section headings and options that deviate from the established defaults of the regular workstation boot process.

If you are using IPX and have not changed the default hardware settings on the network board, you do not need a NET.CFG file.

You need a NET.CFG file if you are using Novell's LAN Workplace or a third-party protocol or if you have changed hardware configuration options without using a *PS/2 REFERENCE* diskette.

Note: The SHELL.CFG file also contains network configuration information. For ODI workstations, information in SHELL.CFG may be placed in the more versatile NET.CFG file. Options from the SHELL.CFG file can be specified in the NET.CFG file.

If you are already using a SHELL.CFG file, leave the commands in that file. If you do not have a SHELL.CFG, you should place all those commands at the beginning of the NET.CFG file.

If a SHELL.CFG file exists and you place SHELL.CFG options in the NET.CFG file, they will be ignored.

Sample NET.CFG file

```
LINK DRIVER NE1000
    ; Change the interrupt (IRQ) to 5.
    INT 5
    ; Change the port to 320 (hex)
    PORT 320
```


Create the file

1. At the DOS prompt, create the file using COPY CON or a text editor.
2. Specify only those parameters that will change from the default settings.
3. Use the following conventions:
   - Main section headings are left-justified and indented with either a space or a tab under each heading.
   - The heading must precede the options you want to include in that section.
   - Options and main headings are not case sensitive.
4. The following are main section headings in the NET.CFG file:
   - Link support
   - Protocol (*protocol_name*)
   - Link driver (*drivername*)
5. Precede comments with a semicolon (;). End each line with a hard return.
6. Write all numbers in decimal notation except where noted otherwise.

The following sections contain a brief explanation of each option's function and some possible reasons for changing the setting. In the explanations, these conventions are used:

[ ]	An optional element
number	A decimal number
hex	A hexadecimal number

Link support

BUFFERS communication_number [size] This option configures the number and size of receive buffers that will be maintained by the LSL.

The number of communication buffers must be large enough to hold all media headers and the maximum data size. The default is 0.

Note: The IPXODI protocol stack does not use the Link Support Layer communication buffers. Novell's TCP/IP protocol stack requires at least two buffers.

Refer to the documentation for the third-party protocol stack for settings.

Buffer size is optional. The minimum size is 618. The total buffer space must fit into approximately 59KB (*number* times *buffer size*). The default is 1130.

MEMPOOL number [k] Some protocols use this option to configure the size of the memory pool buffers that the Link Support Layer will maintain.

Note: The IPXODI protocol stack does not use the MEMPOOL buffers.

Refer to the documentation for the third-party protocol stack for settings. Novell's TCP/IP protocol stack requires at least 2048 bytes of memory pool.

The *k* notation means multiply by 1024.

Protocol protocol_name

BIND name Usually IPXODI binds to the first network board it finds. This option limits the search to the network board you specify.

Replace *name* with one of the following LAN driver names:

NE1000 (for Novell Ethernet NE1000)

NE2000 (for Novell Ethernet NE2000)

NE2 (for Novell Ethernet NE/2)

NE2-32 (for Novell Ethernet NE/2-32)

3C501 (for 3COM EtherLink)

3C503 (for 3Com EtherLink Series 503)

3C505 (for 3COM EtherLink Plus)

3C523 (for 3Com EtherLink/MC 3C523)

LANSUP (for the IBM LAN Support program only)

PCN2 (for IBM PC Network II and II/A)

TOKEN (for IBM Token-Ring)

TRXNET (for Novell RX-Net and Turbo RX-Net)

EXOS205 (for Novell EXOS205 Ethernet)

EXOS215 (for Novell EXOS215 Ethernet)

For example, if you wanted IPX to bind to the 3C523 board, the NET.CFG would look like this:

```
Protocol IPX
   Bind 3C523
```

Note: If you are using a third-party driver, replace *name* with its driver name.

In a DOS environment, you can bind IPXODI.COM to only one network board.

For example, if you load an NE1000.COM driver and then load an NE2000.COM driver, but specify no BIND option in the NET.CFG, IPXODI binds to the NE1000 board. However, if you place BIND NE2000 in the NET.CFG file, IPXODI binds to the NE2000 board.

SESSIONS number This option configures the number of sessions that the protocol stack will be required to maintain at one time.

See the third-party protocol documentation for applicability.

Note: IPXODI ignores this parameter.

Link Driver drivername

To use this heading, replace *drivername* with the name of the driver you are using; the name is typically the LAN driver's filename.

Replace *drivername* with one of the following driver names:

NE1000 (for Novell Ethernet NE1000)

NE2000 (for Novell Ethernet NE2000)

NE2 (for Novell Ethernet NE/2)

NE2-32 (for Novell Ethernet NE/2-32)

3C501 (for 3COM EtherLink)

3C503 (for 3Com EtherLink Series 503)

3C505 (for 3COM EtherLink Plus)

3C523 (for 3Com EtherLink/MC 3C523)

LANSUP (for the IBM LAN Support program only)

PCN2 (for IBM PC Network II and II/A)

TOKEN (for IBM Token-Ring)

TRXNET (for Novell RX-Net and Turbo RX-Net)

EXOS205 (for Novell EXOS205 Ethernet)

EXOS215 (for Novell EXOS215 Ethernet)

After specifying a driver name, place both hardware commands and software commands under the Link Driver heading.

You can use these options with as many different network boards as you have, but you must have a separate Link Driver driver name heading for each board.

Hardware commands

DMA [#1 | #2] channel_number This option specifies the hardware setting of the network board used in the workstation. This option allows DMA channels to be configured.

Enter the channel number to be used. If you do not specify either of the two configurable channels, #1 or #2, this option defaults to the first configurable channel (#1).

You do not need to include the #1 option if you are using only the default option. For example, if the first configurable DMA channel on your board uses DMA channel 3, place the following lines in your NET.CFG file:

```
Link Driver name
  DMA 3
```

If, however, you are using the first and second DMA channels, you do need to include the pound sign (#) for the second channel. For example, if the first configurable DMA channel on your board will use channel 3 and the second configurable channel will use channel 4, place the following lines in your NET.CFG file:

```
Link Driver name
  DMA 3
  DMA #2 4
```

INT [#1 | #2] Interrupt_request_number This option specifies which interrupts the network board uses. Use the interrupt request number set on the board.

If you do not specify which interrupt line (#1 or #2) to configure, this option uses the default, which is the first configurable interrupt line (#1).

Do not include the #1 option if you are using only the default option.

For example, if the first configurable interrupt line on your board will use IRQ 2, place the following lines in your NET.CFG file:

```
Link Driver name
  Int 2
```

If your board can use two configurable interrupt lines and you want to use both of them or only the second one, you must specify the interrupt line (#1 or #2) to configure.

For example, if the first configurable interrupt line on your board will use IRQ 2 and the second will use IRQ 3, place the following lines in your NET.CFG file:

```
Link Driver name
  Int 2
  Int #2 3
```

The second INT channel requires you to use the pound sign (#).

Note: If you are using Microsoft Windows 3.0, set your board to an interrupt other than IRQ2 to avoid unreliable results.

MEM [#1 | #2] hex_starting_address [hex_length] This option specifies a memory range to be used by the network board.

Use the hexadecimal physical (absolute) address of the memory used by the board. (This starting address must match the starting address configured on the board.)

Enter the length (in hexadecimal paragraphs) of the memory address range used by the board. A paragraph is normally 16 bytes.

For example, to address a board from D0000 to D4000 (bytes), the starting address is D0000 and the range is 400 (paragraphs in 16KB decimal length). In this case, place the following lines in your NET.CFG file:

```
Link Driver name
  Mem D0000
```

Usually, the length is not needed.

PORT [#1 | #2] hex_starting_address [hex_number_of_ports] Use this option to specify the starting port and number of ports in the range. All values must be written in hexadecimal notation.

Use the starting hexadecimal I/O port number.

Use the hexadecimal number of ports in the range. If your network board can use two ranges and you want to use either the second range or both ranges, you must specify which range (#1 or #2) to use.

For example, suppose you want to specify the starting port and the number of ports in the first range on your board. The starting I/O port is 300; 16 ports are in the first range. Place the following lines in the NET.CFG file:

```
Link Driver name
  Port 300
```

The number of ports is optional.

NODE ADDRESS hex_address This option overrides any hard-coded node address in the network board, if the hardware allows it. Use the hexadecimal address number.

Changing the node address on a board can create conflicts with other network boards. Stay with the hard-coded node address whenever possible.

The example below shows how to change the node address on a 3C523 board:

```
Link Driver 3C523
  Node Address 12D43
```

SLOT number This option disables the default scan. Use the number of the slot into which you inserted the board. The slot number is found on the back of the computer. The LAN driver will use the board in this slot.

For example, if you are using two NE/2 boards in the same workstation and you insert one board into slot 1 and the other into slot 2, place the following lines in your NET.CFG file:

```
Link Driver NE2

Link Driver NE2
  Slot 2
```

Then place the following lines in your AUTOEXEC.BAT file:

```
LSL
NE2
NE2
```

Software commands

DOS NAME = name This option specifies the name of the DOS version used by the workstation. This should correspond to the %OS name in the login script and the name of the DOS directory. This could be MSDOS, PCDOS, DRDOS, etc., and may not be longer than 5 characters.

ENVIRONMENT PAD = number This option specifies the number of bytes that may be added to the environment space for storing search drive path names. If you are specifying many long path names for search drives with the MAP command, you may need to add extra environment space to hold those names. This may be any number from 17 to 512; 17 is the default. We recommend that you leave this option at the default value unless you are encountering environment space problems.

FRAME frame_type This option specifies the frame type that is used with the network board. Use this option with boards that support more than one frame type.

For example, to specify an Ethernet board using the Ethernet II frame type, place the following line in the NET.CFG file beneath the heading for that driver:

```
Frame ETHERNET_II
```

Usually, Ethernet LAN drivers default to Ethernet_802.3; Token-Ring LAN drivers default to Token-Ring.

PROTOCOL name hex_protocol_ID frame_type This option allows new protocols to be handled by existing LAN drivers.

Replace *name* with the name of the new protocol. Use the assigned hexadecimal protocol ID number. Replace *frame_type* with the frame type that the new protocol ID applies to.

For example, if you would like to use a new protocol (XYZ) with an NE2-32 network board, the NET.CFG file would look similar to the following:

```
Link Driver NE2-32
Frame ETHERNET_SNAP
Protocol XYZ 904A ETHERNET_SNAP
```

If you use both IPX and an additional protocol (XYZ), you must include the protocol ID for IPX and for XYZ. The NET.CFG would look like the following:

```
Link Driver NE2-32
Frame Ethernet_II
Frame Ethernet_802.3
Protocol IPX 0 Ethernet_802.3
Protocol XYZ 1234 Ethernet_II
```

SAPS number If you use the LANSUP driver, you may specify the number of Service Access Points (SAPs) needed. Set the option to allow for all applications using the IBM LAN Support Program. The maximum value depends on the type of board used. The default is 1.

LINK STATIONS number If you use the LANSUP driver, you may specify the number of link stations needed. Set the option to allow for all applications using the IBM LAN Support Program. The maximum value depends on the type of board used. The default is 1.

ALTERNATE Normally the LANSUP, Token, and PCN2 drivers will utilize the primary adapter. Use this option if you want the driver to use a different adapter.

Specify ALTERNATE under the appropriate driver section heading as shown below:

```
Link Driver LANSUP
  ALTERNATE
```

MAX PACKET SIZE number This option sets the maximum number of bytes that can be put on the wire by the Token-Ring Adapter. The default size is 4216 bytes. But if your board has 8KB of shared RAM available, the default size is 2168 bytes.

The value for number must be a multiple of 8. It must include the number of bytes for both the data packet desired and the largest header (currently 114 bytes) that might be used.

The final number, the sum of the bytes for the data packet and the header, must be between 632 and 17,960 bytes. For example, if you wanted to use 10 KB packets, the number would be calculated as

```
10240 + 114 = 10354
```

round up to the next multiple of 8: 10360.

The NET.CFG file would look similar to the following:

```
Link Driver TOKEN
  MAX FRAME SIZE 10360
```

Note: Tests show no significant improvement in performance when a frame size is larger than 4216 bytes. The larger frame size leaves less room for receive buffers; therefore, the number of frames that can be handled by the adapter at one time will decrease.

Manage workstation security

There are a number of things that you as the Supervisor can do to ensure the security of the network through workstation management.

- The WATCHDOG console command may be used to clear (disconnect) a workstation that has not had activity for a specified amount of time. You can use this when users forget to log out when leaving their workstations. Using this command would help prevent unauthorized users from gaining access to the network. See "WATCHDOG" in "Utilities reference," on page 469.

- The WSUPDATE utility can be used to automatically update workstation files from the server when the user logs in. See "WSUPDATE" in "Utilities reference," on page 472.
- You can restrict the days and times of day that users can log in to the file server, as well as which stations a user can use to log in. This is done by setting login restrictions with the SYSCON utility. See "Login restrictions" in the Master Index for page references.

Where to go from here

If you are performing an initial installation, go to "Logging in and out" on page 69.

Managing routers

This section tells you how to set up routers on a network after the network software has been installed on the file server. It tells you how to boot dedicated and nondedicated routers, load VAPs, and set up the ROUTER.CFG file.

Before setting up routers using procedures in this section, you should have installed the network hardware and software as discussed in *Installing and Maintaining the Network*, and set up the file server as discussed in "Managing the file server."

You should be familiar with the following topics found in *Concepts* before working with this section so that you can make the best use possible of the information found here.

Router
VAP

Installing and Maintaining the Network describes the procedure used to run ROUTEGEN and create the router files used in the following procedures.

Create a router boot disk

After running ROUTEGEN, you are ready to create a boot disk that will boot the router. Prepare a boot disk by doing the following:

- **Hard disk.** Prepare the disk to boot with DOS according to the manufacturer's instructions.
- **Floppy diskette.** Format a blank diskette using the DOS 3.*x* or 4.*x* FORMAT command and the /S parameter.

The boot disk can be used for either a dedicated or a nondedicated router.

Dedicated router boot disk

After preparing the disk for booting, do the following:

1. Copy the ROUTER.EXE file to the boot disk, either floppy or hard disk. This file is found on the *ROUTEGEN* floppy disk (if ROUTEGEN was run from a floppy) or in the \ROUTEGEN subdirectory on the hard disk (if ROUTEGEN was run from a hard disk).

2. Create an AUTOEXEC.BAT file on the boot disk using COPY CON or a text editor.

   The batch file should have the following lines if you are creating a boot disk for a dedicated router:

   ```
   ROUTER
   ```

   This will start the router.

Nondedicated router boot disk

After preparing the disk for booting, do the following:

1. Copy the ROUTER.EXE file to the boot disk, either floppy or hard disk. This file is found on the *ROUTEGEN* floppy disk (if ROUTEGEN was run from a floppy) or in the \ROUTEGEN subdirectory on the hard disk (if ROUTEGEN was run from a hard disk). Also copy the CONSOLE.COM file from the \LOGIN directory on the *DOSUTIL-1* diskette to the boot disk.

2. Create a CONFIG.SYS file on the boot disk with the following lines:

   ```
   FILES=20
   BUFFERS=20
   ```

3. Create an AUTOEXEC.BAT file on the boot disk using COPY CON or a text editor. The batch file should have the following lines if you are creating a boot disk for a nondedicated router:

   ```
   ROUTER
   NETx
   F:
   LOGIN
   ```

   NET*x* is NET3 if you are using DOS 3.*x*, and NET4 if you are using DOS 4.*x*. This will start the router, load the workstation files, then prompt you for a login name.

Boot the router

Boot the router from the hard disk or the floppy diskette prepared in the steps above.

When the router software is loaded, a message similar to the following appears on the screen:

```
NetWare Real Mode Internetwork Router

Initializing LAN A
:
```

If the router is dedicated, the console prompt (:) will appear, telling you that the router is running.

If the router is nondedicated, the router will be loaded, the workstation files will be loaded, then you will be prompted for a login name and password.

You can switch a nondedicated router to console mode by typing

CONSOLE <Enter>

You can switch back to DOS mode by typing

DOS <Enter>

You can use the following console commands at the router's console prompt:

CONFIG
DOS
DOWN
MONITOR
OFF
VAP

For more information on the use of these commands, see "Utilities reference" in this manual.

Load VAPs

Any VAPs you use must be loaded during the NetWare router bootup. As a general rule, VAP files are copied to the boot disk (hard disk or floppy diskette) that is used to boot the router. See the documentation that came with your VAP for more information.

If you have copied VAP files to the same diskette or hard disk directory as the ROUTER.EXE file, a prompt similar to the following appears on the screen as the router is booting.

```
Value Added Processes have been defined. Do you wish to load them? y
```

You must respond to this message before the booting process can continue.

If you plan to run any VAPs in your NetWare router, you may want to have them load automatically each time the router boots. If so, continue with the following section.

Customize VAP loading with ROUTER.CFG

The ROUTER.CFG file allows you to specify the following:

- How long the router will wait before loading the VAPs (this gives you an opportunity to terminate VAP loading)
- A directory path to the VAPs

If you include a ROUTER.CFG file on the same diskette or hard disk directory as ROUTER.EXE, you will not have to answer any prompt each time the router is booted.

Create the ROUTER.CFG file

ROUTER.CFG contains only two lines. You must type the lines as shown in the following instructions. Do not include any extra spaces or blank lines in the file.

Create the ROUTER.CFG file with COPY CON or a text editor. You must place the ROUTER.CFG text file on the same diskette as the ROUTER.EXE file, or in the same directory if you are booting from a hard disk.

ROUTER.CFG commands to include

The following commands may be entered in the ROUTER.CFG file.

VAP WAIT number This command allows you to specify the number of seconds the router should wait before automatically loading the VAPs.

You can specify a waiting period of 10 to 360 seconds. (The default is 10 seconds if no amount is specified.)

VAP DISK path This command allows you to specify the location of VAP files. This is especially helpful if VAP files are too large to fit on the diskette containing the ROUTER.EXE file. If the path is not specified, then drive A is assumed. Only one diskette with VAPs can be loaded; if more VAPs need to be loaded, copy them to the hard disk, then load them from there.

Note: If you have run MacSetup to set up a boot disk with the Macintosh VAPs for a router, you will already have a ROUTER.CFG file with this line in it.

Substitute the drive letter and path to the VAP files for the *path* variable.

- If a path to a hard disk directory is specified, the VAPs will be loaded automatically when the router is booted.
- If a path to a floppy disk drive is specified, you will see a prompt similar to the following on the screen:

```
Insert Diskette containing VAPs to be loaded, then PRESS RETURN KEY
TO CONTINUE VAP Loading
```

Using ROUTER.CFG

After you have created the ROUTER.CFG file, copy it to the diskette or hard disk directory that contains the ROUTER.EXE file.

As you boot the router, you will see a message similar to the following:

```
To Abort Loading of VAPS, Press Any Key

Time Left to Abort: xxx seconds
```

To terminate loading of VAPs, press any key. A message similar to the following will be displayed:

```
VAP Loading Aborted
```

If you have entered any invalid keywords in the ROUTER.CFG file, you see the following message when the file server boots:

```
Invalid configuration parameter
```

If you specify any invalid values in the file, they will be set to a value of 10. If the VAP disk path is correct then the VAPs won't load. To correct errors, recreate or edit the file.

Check the ROUTER.CFG file for incorrect information or incorrectly entered information (such as misspellings or extra spaces between key words).

Note: If you are using a real mode router, you may run out of memory when loading VAPs, as real mode only allows the router to use 640KB of memory. If this occurs, you will need to use protected mode for the router; this will allow the router to use more than 640KB of memory (if it is installed). See *Installing and Maintaining the Network*.

Logging in and out

This section tells you the procedures for logging in the first time as SUPERVISOR, creating the system login script, and creating user login scripts. All valid login script commands are described in this section.

Before setting up logins using procedures in this section, you should have installed the network hardware and software as discussed in *Installing and Maintaining the Network*, and set up the file server as discussed in "Managing the file server" in this manual. You may set up logins either before or after setting up workstations.

You should be familiar with the following topics found in *Concepts* before working with this section so that you can make the best use possible of the information found here.

Boot files
DOS version
Log in
Log out
Login script
NetBIOS emulator
NetWare workstation files
Password
Security
User account

Log in as SUPERVISOR

In order to perform most of the setup procedures on the network, you must be logged in as SUPERVISOR. To do this, follow these instructions:

1. Boot the file server if it isn't already running. See "Managing the file server."
2. Boot a workstation if you don't already have one running. See "Managing DOS workstations." You will need the workstation boot diskette created with procedures discussed in that section.
3. At the DOS prompt on the workstation, type

   LOGIN SUPERVISOR <Enter>

Set SUPERVISOR password

After logging in to the server as SUPERVISOR, you should immediately set the password for the SUPERVISOR account so that the network is protected.

1. Type

   SETPASS <Enter>

2. Enter the password you want to use, then press <Enter>. You will be prompted to enter the password again.

3. Enter the password again to verify that you entered it correctly. Press <Enter>.

We also recommend that you create a SUPERVISOR-equivalent user so that you always have two ways to access the file server. The quick path for doing this using the SYSCON utility is found on page 228 of the task list.

Where to go from here

If you are doing an initial network setup, go to "Organizing and accessing files" on page 111. After you have created users and groups, return to this point and continue with "Plan and create login scripts."

Plan and create login scripts

You need to create two kinds of login scripts: system login scripts and user login scripts.

- **System login script.** The system login script is executed for all users who log in to the server. Put commands in the system login script that would apply to all users, such as search drive mappings to applications and the NetWare utilities.
- **User login script for each user.** User login scripts are specific for each user and will be executed after the system login script. Put commands in the user login script that would apply only to the specific user.

If a user login script does not exist, a default login script will be executed. This is the login script used when the SUPERVISOR logs in for the first time.

The basic principle of creating login scripts is to include as much as possible in the system login script. The more the system login script accomplishes, the shorter user login scripts can be. See "Sample login scripts" on page 72 to see what type of commands to put in each.

These conventions apply to creating login scripts:

- Command lines cannot exceed 150 characters. To increase readability, however, we recommend that you use only 78 characters per line, which is the width of your screen.
- Only one command can be entered on each line. The command interpreter reads the script one line at a time. Be sure to press <Enter> at the end of each command.
- Command line utilities may be included in the login script; they must be preceded by a pound sign (#). Login script commands are entered on the line without any special characters.
- Commands can be entered in either uppercase or lowercase letters. Identifier variables enclosed in quotation marks must be typed in uppercase letters.
- Comments can be included after all commands except ATTACH, COMSPEC, DOS SET, EXIT, MAP, and WRITE.

Because login scripts set up the network environment for users, the script should be carefully planned. We recommend that you use the "Login Scripts Worksheet" found in the back of this manual to help you plan your system and user login scripts. Review the example login scripts on the following pages. For more information, see **Login scripts** in *Concepts*.

To create a system login script, do the following after logging in as SUPERVISOR:

1. Access the SYSCON utility by typing

   SYSCON <Enter>

2. Select "Supervisor Options" from the "Available Topics" menu.
3. Select "System Login Script" from the "Supervisor Options" menu.
4. On the screen that appears, enter commands that you want to appear in the system login script. Login script commands are explained on pages 74 through 110.
5. When you are finished writing the script, press <Esc>, then answer "Y" for "Save Changes?"

Create a sound system login script before you create a user login script. The network environment (specifically search drives) created by the default login script will not be set for any user who has a user login script.

To create a user login script, do the following:

1. Access the SYSCON utility by typing

   SYSCON <Enter>

2. Select "User Information" from the "Available Topics" menu.

3. Select the name of the user for whom you are creating the login script.

4. Select "Login Script" from the "User Information" menu.

5. On the screen that appears, enter commands that you want to appear in the system login script. Login script commands are explained on pages 74 through 110.

6. When you are finished writing the script, press <Esc>, then answer "Y" for "Save Changes?"

Sample login scripts

Following are two examples of system login scripts and one example of a user login script. Use them to get ideas for setting up your own system and user login scripts; make sure to adapt them to your own system setup and directory structure. Each of the commands in the sample scripts is explained on pages 74 through 110.

Example 1: system login script

```
MAP DISPLAY OFF
MAP S1:=SYS:PUBLIC
MAP S2:=SYS:PUBLIC/%MACHINE/%OS/%OS_VERSION
MAP S3:=SYS:PUBLIC/APPLIC/WP
MAP S4:=SYS:PUBLIC/APPLIC/DB
MAP S5:=SYS:ATC/EXE
MAP S6:=SYS:ACS
MAP *1:=SYS:USERS/%LOGIN_NAME
MAP DISPLAY ON
MAP
WRITE
WRITE
```

```
WRITE "GOOD %GREETING_TIME, %LOGIN_NAME"
REM IDENTIFIERS PLACED IN QUOTES MUST BE IN UPPER CASE
REM WITH THE % PRECEDING THE IDENTIFIER
WRITE
WRITE
INCLUDE SYS:PUBLIC\SCRIPTS
PAUSE
WRITE
DISPLAY SYS:SUPERVISOR\MESSAGE
FIRE 4
PAUSE EXIT "MAIL"
END
```

Example 2: system login script

```
Write "Good %GREETING_TIME, %LOGIN_NAME.
MAP DISPLAY OFF
MAP ERRORS OFF
IF LOGIN_NAME <> "SUPERVISOR" THEN BEGIN
  MAP *1:=DC-2/SYS:HOME
  MAP *2:=DC-2/SYS:TRASH
  MAP *3:=DC-2/SYS:SYSTEM
  MAP *4:=DC-2/SYS:LOGIN
  MAP *5:=DC-2/SYS:PUBLIC
END
MAP S1:=DC-2/SYS:PUBLIC
MAP S2:=DC-2/SYS:PUBLIC\%OS_VERSION\%MACHINE
MAP S3:=DC-2/SYS:PUBLIC\TCP_OPT
COMSPEC=S2:COMMAND.COM
MAP DISPLAY ON
MAP
DOS SET USER="LOGIN_NAME"
WRITE " "
WRITE "TYPE DSSMENU TO ENTER THE DECISION SUPPORT
SERVICES NETWORK MENU."
WRITE "IF YOU WISH TO USE THE TCP GATEWAY, EXECUTE"
WRITE "NETBIOS BEFORE ENTERING THE MENU SYSTEM."
```

Example 3: user login script

```
MAP G:=SYS:USERS\KALEB\REPORTS
MAP H:=SYS:USERS\KALEB\LETTERS
#CAPTURE P=1 NB TI=10 NFF
IF DAY_OF_WEEK = "FRIDAY" THEN BEGIN
    FIRE 9
    WRITE "FRIDAY AGAIN, TIME TO PRINT THE REPORTS"
    MAP I:=SYS:APPLIC/DBB/REPGEN
END
SET PROMPT $p$g
EXIT "GOMENU"
REM GOMENU.BAT CONTAINS THE COMMAND "MENU FILENAME"
```

Where to go from here

If you are performing an initial network setup, we recommend you now set up network printing. Go to either "Using core printing" on page 131, or refer to the *Print Server* manual for instructions.

Login script commands

The following chart lists the login commands that you can include in login scripts. Login script commands are described alphabetically on the pages after this chart.

Login Script Command	Description
ATTACH	Connect to additional network file servers.
BREAK	Determines whether login script execution can be interrupted.
COMSPEC	Locates the proper COMMAND.COM (DOS) file for the computer and operating system being used after program exits.
DISPLAY AND FDISPLAY	Displays the text of a specified file on your screen.
DOS BREAK	Controls what type of commands can be interrupted by pressing <Ctrl><Break> or <Ctrl><C>.
DOS SET	Sets a DOS variable to a specified value.
DOS VERIFY	Ensures data copied to a local drive is copied correctly.
DRIVE	Specifies which drive is the default drive.
EXIT	Aborts the login procedure.
#(EXTERNAL PROGRAM EXECUTION)	Allows users to temporarily exit the login procedure to access a file, a menu, or a program.
FIRE PHASERS	Produces a phaser sound.
GOTO	Execute a portion of the login script out of sequence.
IF...THEN	Sets conditions under which login commands will be executed.
INCLUDE	Accesses text files (subscripts) not usually included in the login script.
MACHINE NAME	Specifies which computer (machine name) is being used for the workstation in question.
MAP	Maps a drive to a directory on the network.
PASSWORD_ EXPIRES	Notify user of how many days before password expires.
PAUSE	Stops login script execution until a key is pressed.
PCCOMPATIBLE	Informs the login program that a machine is IBM-PC compatible.
REMARK	Allows users to insert descriptive comments (as opposed to commands) into the login script.
SHIFT	Shift command line parameters to the next variable.
WRITE	Writes the specified string on the screen during login.

ATTACH

Use ATTACH to connect to additional network file servers without interrupting the current execution of the login script.

Command format

ATTACH [fileserver[/username[;password]]]

How to use ATTACH

Enter the command and applicable parameters in your login script.

ATTACH

You can also specify a file server, a username, and a password.

If you use the ATTACH command without supplying the above-mentioned variables, you will be prompted to enter them when you log in. The following prompts appear (one at a time) on your screen:

```
Enter the server name:

Enter login name for server <file server>:

Enter password for user <Username> on server <file server>:
```

You will be prompted to enter only those variables that you have not included. For example, if you enter ATTACH and the name of the file server in your login script, you will be prompted to enter only the login name and password for that file server when you log in.

Example

To attach to file server FS2 as the supervisor (whose password is "Pizza"), you would enter the following in the login script:

ATTACH FS2/SUPERVISOR;PIZZA

We do not recommend that you include passwords with the ATTACH command because it could create a possible security problem; someone else can see your passwords if they gain access to your login script. A better way to get around entering a password for other servers is to synchronize your passwords. See "SETPASS" in "Utilities reference," on page 428.

We also do not recommend that you attach to file servers from a login script unless the connection is required for supervisory

reasons or for regular, frequent sharing of network resources. For occasional network communication, it is better to execute the ATTACH command line utility.

If there are several file servers to which you regularly attach, we recommend that you use the same username and password on each file server (unless you attach as GUEST, since GUEST usually does not require a password). In this case, the command ATTACH FS2 will attach your workstation to FS2 and log you in using the username and password you specified when you logged in to the default file server.

However, even if you use different usernames and passwords for different file servers, you can still place the ATTACH FS2 command in your login script. The login program will prompt you to enter the username and password (if a password is required) for the file server to which you are attaching.

By using the same username and password on several file servers and attaching to them in your login script, you will also gain an additional advantage. If your password expires on any of the servers, the login program will let you enter a new password and synchronize your password on all other file servers for which you have a username and a password.

BREAK

Use BREAK ON to stop the execution of your login script during login. If you include the BREAK OFF command in your login script, you will not be able to stop the execution of your login script.

Command format

BREAK ON|OFF

How to use BREAK

If you have entered the BREAK ON command in your login script, you can press <Ctrl> C or <Ctrl> <Break> at any time you want to abort the normal execution of your login script.

To specify whether the execution of your login script can be stopped, enter the appropriate version of this command in your login script. Enter

BREAK ON

or

BREAK OFF

Entering this command into your login script does not affect the DOS <Ctrl> <Break> check.

When the BREAK option is "ON," type-ahead keyboard input will not be saved in the buffer. If you find this side effect undesirable, you may want to leave the break option in its default form: BREAK OFF.

COMSPEC

Use COMSPEC to specify the file that DOS uses to reload the command interpreter. This command interpreter is usually COMMAND.COM, but could be a different program. For more information see **Login scripts** in *Concepts*.

Command format

To specify that the command interpreter is loaded from the directory to which the *n*th network drive maps, enter the command as follows:

```
COMSPEC = *n:[/]filename
```

To specify that the command interpreter is loaded from a particular drive (e.g., A, X), enter the command as follows:

```
COMSPEC = drive:[\]filename
```

To specify that the command interpreter is loaded from the directory pointed to by search drive n, enter the command as follows:

```
COMSPEC = Sn:[\]filename
```

How to use COMSPEC

If more than one version of DOS is available on your network, a directory should have been created for each DOS version (see "Organizing and accessing files" on page 111). Using the COMSPEC command in your login script will ensure that the proper version of COMMAND.COM (or other command interpreter) is reloaded.

No more than 12 characters can follow the drive specification.

Examples

To load COMMAND.COM from drive A, enter

```
COMSPEC = A:COMMAND.COM
```

To load COMMAND.COM from the directory to which search drive 2 is mapped when the script command is interpreted, enter

```
COMSPEC = S2:COMMAND.COM
```

DISPLAY and FDISPLAY

Use the DISPLAY and FDISPLAY commands to show the contents of a specified ASCII text file on your workstation screen during the login.

The DISPLAY command will display regular text characters in the text file. Control characters and escape sequences that cannot be correctly displayed will be filtered out and not displayed. Tabs will also not be displayed.

The FDISPLAY command will display all characters in the text file, including ASCII escape sequences. Many control characters and escape sequences will appear as "garbage" on your screen.

Command format

[F]DISPLAY [volume:directory/]filename

How to use DISPLAY and FDISPLAY

To instruct the operating system to display a certain ASCII text file when you log in, enter the DISPLAY or FDISPLAY command and specify the name of the file to display when you log in.

Example

Suppose you put messages in a public bulletin board file (SYS:PUBLIC/MESSAGES/SYSNEWS.TXT, in this example) and you want members of the SALES group to read this file when they log in.

To display this file automatically, you can enter a command similar to the following in the system login script:

```
IF MEMBER of "SALES" THEN
DISPLAY SYS:PUBLIC/MESSAGES/SYSNEWS.TXT
```

If the DISPLAY command is in the system login script, any messages you put in the file will appear on the users' screen when they log in. For example, if you update the SYSNEWS.TXT file with the message, "Meeting for everyone Tuesday at 2:00," users in group SALES will receive the message when they log in.

Users must have at least File Scan and Read rights in the directory in which the text file is stored. If the given directory does not exist or if the given file is not found, no error message will appear on your screen when you log in.

DOS BREAK

Use the DOS BREAK command to specify whether any programs or DOS commands can be interrupted with <Ctrl> <Break> after you have logged in. (This command does not replace the login script BREAK command.)

Command format

```
DOS BREAK ON
```

or

```
DOS BREAK OFF
```

How to use DOS BREAK

To specify the command in your login script, enter

```
DOS BREAK ON
```

or

```
DOS BREAK OFF
```

DOS BREAK ON will enable you to interrupt the execution of the login script at any point after the DOS BREAK command.

This command's default is DOS BREAK OFF. DOS BREAK OFF disables <Ctrl> <Break> immediately after the DOS BREAK command is executed. (This command sets or resets the DOS <Ctrl> <Break> check feature using DOS function 33h. For more information, see the BREAK command in your DOS manual.)

DOS SET

Use the DOS SET command to set a variable in a DOS environment to the specified value. This has the same effect as entering SET on the DOS command line.

Command format

[DOS] SET name = "value"

How to use DOS SET

The DOS SET login script command is similar to the SET command on the DOS command line, but the login script command requires you to enter double quotation marks (" ") around values, while the command line command does not. To give a variable name whatever value you specify, enter the following in your login script:

DOS SET name = "value"

Substitute a specific name in place of the variable (name), and specify the value(s) by which you want the name to be represented.

The DOS SET login script command can have the keywords LOCAL, TEMP, or TEMPORARY preceding it. This sets the variable only in the environment of the LOGIN process, not the master environment.

The value string can contain identifier variable substitutions. For more information about identifier variables, refer to "Identifier variables" on page 90.

Note: The backslash is used as a special programming character in NetWare commands; it will not be recognized as a normal backslash unless you enter two backslashes.

For information about values you can set, see the SET command in your DOS manual.

Example 1

To set your prompt to show your directory path, enter

DOS SET PROMPT = "PG"

Example 2

To remove a variable from the DOS environment, leave the command line blank after the equal sign. Enter

```
DOS SET name =
```

or

```
SET name =
```

Note: Since DOS environments have a fixed maximum size, this command cannot work if your environment is too small. To increase the environment size, enter "SHELL=COMMAND.COM /P /E:200" in the CONFIG.SYS file. This command increases the environment size from 127 to 200 bytes (if you are using DOS 3.2 or above). For more information about environment size, see the SHELL command in your DOS manual.

DOS VERIFY

Use the DOS VERIFY command to ensure that data copied to a local drive has been copied correctly.

Command format

```
DOS VERIFY ON
```

or

```
DOS VERIFY OFF
```

How to use DOS VERIFY

The DOS COPY command does not automatically verify that data has been correctly copied to a local drive. If you want DOS to make the same verification, you must enter the DOS VERIFY ON command in your login script.

In your login script, enter

```
DOS VERIFY ON
```

or

```
DOS VERIFY OFF
```

If the DOS VERIFY ON command has been entered in the login script, DOS automatically verifies that data copied to a local drive using the DOS COPY command has been copied correctly. If DOS VERIFY has been set to OFF, no verification takes place.

If you have entered a DOS VERIFY OFF command in your login script but still want a particular copy verified, you must add the /v option to the DOS COPY command, as in the following example:

```
COPY filename TO local drive:/v
```

In other words, if you want to make sure that data copied to a local drive has been copied correctly, you can do either of the following:

- Enter the DOS VERIFY ON command in your login script.
- Add the /v option to the DOS COPY command.

DRIVE

You can use the DRIVE command to specify which drive is your default drive.

Command format

DRIVE x: (where x = a letter)

or

DRIVE *n: (where n = a number)

How to use DRIVE

Unless you have entered this command in your login script, your default drive is set to the first network drive, which is often assigned to your home directory when you log in.

Enter the DRIVE command in your login script, replacing *x* with the appropriate drive. For example, to specify drive J as your default drive, enter

DRIVE J:

The drive you specify must be defined in your login script in a separate MAP command entered on any line above the DRIVE command entry.

Example

Suppose you expect to be working on only one project for several days, and the information for the project is located on drive S. You can use the DRIVE command to set your default drive to S (so you won't have to change the drive specification manually every time you log in). To do this, enter

DRIVE S:

EXIT

Use the EXIT command to terminate execution of the LOGIN command line utility.

Command format

```
EXIT
```

or

```
EXIT "filename"
```

How to use EXIT

Enter the following in your login script:

```
EXIT
```

Any login script command entered on any line below the EXIT statement will be ignored. This command allows you to execute .COM, .EXE, and .BAT files and DOS internal commands, such as DIR.

You can also use the EXIT command to pass a short command line to COMMAND.COM (the command interpreter file for the operating system you are using). The command specified cannot exceed 14 characters. To pass a command to COMMAND.COM, enter the following in your login script:

```
EXIT "filename"
```

Do not use the EXIT command in your login script to exit to a terminate-and-stay resident (TSR) program (such as SideKick or any terminal emulator that terminates and stays resident).

The EXIT login script command works only on IBM PCs. To use EXIT with a PC-compatible, you must enter the PCCOMPATIBLE command in the login script before you enter the EXIT command.

Example

If you want to exit the LOGIN utility to the electronic mail system (ATC, for example), enter the following IF ... THEN statement in your login script:

```
IF "%1" = "ATC" THEN EXIT "ATC"
```

EXTERNAL PROGRAM EXECUTION (#)

Use EXTERNAL PROGRAM EXECUTION (#) to execute a command that is not a login script command. See the table on page 74 for a list of valid login script commands; any command that is not on that list must be preceded by a pound sign (#) if it is included in the login script.

Command format

```
# [directory/] filename parameter line
```

How to use EXTERNAL PROGRAM EXECUTION (#)

If you want the LOGIN utility to execute a command that is not a login script command, enter this command in the script preceded by a pound sign (#). You can

- Specify a directory path before the filename.
- Add parameters after the filename, just as if the command were being executed manually from the DOS prompt.

The following restrictions apply:

- The command statement must appear on its own line.
- The first character on the script line must be a pound sign (#).
- The filename must be the name of the .EXE or .COM program you want to execute.
- The command should appear after MAP assignments, since the program will execute in the environment of drive mappings, default drives, and search drives set up previously in the login script.

This command function will fail if the given directory is invalid, if proper security rights are lacking, if the executable file cannot be found, or if there is insufficient workstation memory to load the executable file.

The login script is held in memory when the External Program Execution (#) command is run. The login script is not released from memory until you return to the script and complete it or exit the script.

Example

Rather than having to enter the CAPTURE command after every time you log in, you could include it in your login script. Enter the CAPTURE command on a line in the login script preceded by the pound sign (#) and include the CAPTURE command options. See "CAPTURE" in "Utilities reference," on page 258. For example

```
#CAPTURE ti=10 nb
```

FIRE PHASERS

Use the FIRE PHASERS command to alert you.

Command format

FIRE PHASERS n TIMES

How to use FIRE PHASERS

To instruct the operating system to fire phasers automatically, enter the following in your login script:

FIRE PHASERS n TIMES

(The *n* represents the number of times you want to hear this sound. You can fire phasers up to nine times).

Example 1

Suppose you want to hear the "phaser" sound four times when you log in. In your login script, enter

FIRE PHASERS 4 TIMES

Example 2

This command can be used with the IF ... THEN command. You can specify that the sound will be generated a different number of times depending on the circumstances of the login.

For example, you could instruct the system to fire the phasers three times if the day is Thursday by entering the following command:

IF DAY_OF_WEEK = "Thursday" THEN FIRE PHASERS 3 TIMES

GOTO

Use the GOTO command when you want to execute a portion of the login script out of the regular sequence.

Command format

GOTO label

Use *label* to indicate where you want to continue executing the login script.

How to use GOTO

Do not use GOTO from within a BEGIN/END pair. Labels must be alone on a line or followed by a comment.

For example, to execute a loop of commands, you could include the following:

```
SET X = "1"
LOOP:
SET X = <X> + "1"   ;see compound strings for this WRITE <X>
IF <X> IS LESS THAN VALUE "10" then GOTO LOOP
```

IF ... THEN

Use the IF ... THEN command when you want login to perform commands conditionally, depending on whether specified conditions exist.

Command format

IF conditional(s) THEN command

How to use IF ... THEN

Use this command to instruct the operating system to execute certain commands for you, if a specified condition exists. IF statements can be nested. The maximum nesting level is limited to 10.

For example, if you have the following IF ... THEN command in your login script, your workstation screen will display "AARGH..." when you log in on Mondays.

```
IF DAY_OF_WEEK="Monday" THEN WRITE "AARGH..."
```

The conditional is the statement that follows IF. In the example given above, DAY_OF_WEEK="Monday" is the conditional. Conditionals can be made with identifier variables or command line parameters.

Identifier variables

The conditional can contain identifier variables that represent login information that varies depending on the circumstances, such as the date and time. In the example above, DAY_OF_WEEK is the identifier variable. Any DOS environment variable can be accessed as an identifier by enclosing it in angle brackets. Identifier variables can be entered in either uppercase or lowercase letters. For a complete list of identifier variables, see WRITE on page 108.

ERROR_LEVEL You can use the ERROR_LEVEL identifier variable as a conditional to execute a command only if certain conditions are met. ERROR_LEVEL gives you control over error situations. If a command can be successfully executed, the error level will be "0." If a command cannot be executed, the error level will be represented by a value other than "0." You can use an "If ERROR_LEVEL= "0"" conditional to prevent the commands following the "THEN" from being executed if an error occurs.

For example, if you normally need to access files on more than one file server, you could enter the following in your login script:

```
ATTACH file server/username

IF ERROR_LEVEL="0" THEN MAP K:=file
 server/volume:directory/subdirectory
```

If the specified file server is down at the time you log in, an error level of "1" or some value other than "0" will be returned, and the login program will not map a drive to that server. By using the ERROR_LEVEL identifier variable, you can avoid creating an error.

ERROR_LEVEL will search for the last ATTACH or # (EXTERNAL PROGRAM EXECUTION) that was executed in the login script command. For example, if you attached to two file servers, it will search for the second ATTACH command.

The ERROR_LEVEL identifier is set after all commands that can fail. It is set to either the error level of the spawned process or the NetWare error code for internal login script commands.

Note: Allow IF commands to "wrap" to the next line if there is not enough room on one line. Also, the ERROR_LEVEL identifier can be entered with an underscore (_) or as one word (ERRORLEVEL).

[NOT] MEMBER OF "GROUPNAME" The MEMBER OF "GROUPNAME" identifier variable can be used like any other conditional in an IF statement. The MEMBER OF "GROUPNAME" tests whether the user belongs to a certain group that you have defined on the file server. For example, you might have the following command in a user's login script:

```
IF MEMBER OF "SALES" AND DAY_OF_WEEK = "MONDAY" THEN
WRITE "Sales meeting at 10:00; BE THERE!"
```

If the user is a member of the group SALES and it is Monday, he or she receives the message "Sales meeting at 10:00; BE THERE!" when he or she logs in.

SHELL_TYPE Use SHELL_TYPE to test the version number of the network shell.

```
IF SHELL_TYPE = number THEN command
```

Replace *number* with the version number of the network shell you want to match. Replace *command* with a command to execute if the statement is true.

You can use SHELL_TYPE to execute a WRITE or other command if the network shell being used is not the correct version. For example, entering

```
IF SHELL_TYPE != "V3.02" THEN WRITE "WRONG SHELL VERSION"
```

in the login script will display a warning if the shell version is anything other than v3.02.

Command line parameters

You can use command line parameters in IF ... THEN commands in your login script. When you log in, you can specify parameters that the LOGIN command will pass to your login script.

When the login script is interpreted, any percent sign (%) entered in a command and followed by a number from 0 to 19 is replaced by the corresponding parameter from your LOGIN command line.

The file server name always corresponds to %0, and the login username always corresponds to %1. The next entry in the login command line corresponds to %2 in the login script, the next entry corresponds to %3, and so on. (The parameters %2 to %19 are variable.)

You could enter the following LOGIN command:

```
LOGIN COUNT/RON SALES MARKETING LEGAL
```

The server COUNT corresponds to %0 in the login script, the user RON corresponds to %1, the server SALES to %2, the server MARKETING to %3, and the server LEGAL to %4.

Remember that command line parameters are substituted in the script command. For example, "%0"="COUNT" would become "COUNT"="COUNT" as you log in.

Suppose that you want to log in to server COUNT every day, and sometimes you also want to attach to one or two other file servers on the internetwork. Enter the following commands in your login script:

```
IF "%2" DOES NOT EQUAL "" ATTACH %2
IF "%3" DOES NOT EQUAL "" ATTACH %3
```

Then, when you log in, specify the additional file server (if any) that you want to attach to. For example, to log in to server COUNT and attach to servers LEGAL and COMMS, enter

```
LOGIN COUNT/username LEGAL COMMS
```

To log in to server COUNT and attach only to server LEGAL, enter

```
LOGIN COUNT/username LEGAL
```

To log in only to server COUNT, enter

```
LOGIN COUNT/username
```

To attach to different file servers, substitute the server names for LEGAL and COMMS.

Use the SHIFT command to shift the %variable assigned to each command line parameter. For more information, see "SHIFT" on page 106.

Relationships in conditionals

There are six possible relationships between the information contained in an IF ... THEN statement: equal to, not equal to, greater than, less than, greater than or equal to, and less than or equal to.

You can represent equal and not equal relationships in the following ways:

Equal	Not Equal
IS	IS NOT
=	!=
==	<> #
EQUALS	DOES NOT EQUAL NOT EQUAL TO

The other four relationships can be represented as follows:

>	IS GREATER THAN
<	IS LESS THAN
>=	IS GREATER THAN OR EQUAL TO
<=	IS LESS THAN OR EQUAL TO

The keyword VALUE has been added to force numeric rather than ASCII evaluations. In an ASCII evaluation, 10 is less than 5 because only the first integer 1 is compared to 5. VALUE compares the total value of 10 to 5. For example,

```
IF VALUE HOUR24 >= "12" THEN WRITE "afternoon"
```

Conditionals can be joined with commas, the word AND, and the word OR to form compound conditionals. A compound conditional is true only if all of its related conditionals are true. The following are compound conditionals.

```
IF GREETING_TIME IS "AFTERNOON" AND DAY IS "01"
```

(If it is the afternoon of the first day of the month)

```
IF HOUR24="23", MINUTE="59", AND SECOND="59"
```

(If it is 11:59:59 p.m.)

Entering login script commands after THEN

The command following the THEN can be a single statement or the beginning of a block of commands. The statement or block of commands is interpreted only if all of the specified conditions are true.

Single statement The following is an example of a single statement.

```
IF DAY_OF_WEEK="6" THEN
WRITE "HOORAY!  IT'S FRIDAY!"
```

Block of commands You must start a block of commands by specifying BEGIN or DO after the THEN in the IF ... THEN statement. BEGIN or DO must be entered on the same line as the conditional IF. When you have entered all the conditional commands you want, end the block by specifying END.

For example, enter this IF ... THEN statement:

```
IF DAY_OF_WEEK="Tuesday" THEN BEGIN
    WRITE "Staff meeting today at 10 a.m."
    INCLUDE SYS:PUBLIC/UPDATE
END
```

In this case, on Tuesdays you receive the message about staff meeting. Your login script also processes any commands or messages contained in the file SYS:PUBLIC/UPDATE.

INCLUDE

Use INCLUDE to create the login script subscripts that function as extensions to the login script. These subscripts are text files that contain valid script commands (any of the commands explained in this section).

Command format

```
INCLUDE [volume:directory\]filename
```

How to use INCLUDE

Enter the INCLUDE command in your login script, replacing the variables with the directory path and filename of the subscript you need. You can create and edit subscripts using any text editor or word processor.

Note: INCLUDE nesting is limited only by memory. This means that one script file can INCLUDE another script file which, in turn, can INCLUDE yet another script file, and so on. You must have at least File Scan and Read rights in any directory containing a subscript you want to use.

Example 1

Suppose you want to create a special text file containing systemwide announcements. Send the contents of this file to users by entering the command to include the text file in the system login script.

If text file name is SYS:PUBLIC\MESSAGES.INC, include this file in the system login script by entering the following in each user's login script:

```
INCLUDE  SYS:PUBLIC\MESSAGES.INC
```

Then, if you want to post the message "Don't forget 7:30 a.m. meeting tomorrow," the user can use the WRITE command to enter the message in the SYS:PUBLIC\MESSAGES.INC file. When the users log in, each receives the message.

Note: The INCLUDE command does not function in the same way as the DISPLAY or FDISPLAY commands. In order for it to display text as shown in this example, the included file must contain WRITE commands.

Example 2

The INCLUDE command can also be used to shorten users' login scripts. You may want to create one script file and then have each user who needs it include the script file in his or her login script with the INCLUDE command, instead of having the user enter the extra commands in the script.

MACHINE NAME

Use MACHINE NAME to set the machine name of the station to the specified name.

Command format

```
MACHINE NAME = "name"
```

or

```
MACHINE = "name"
```

How to use MACHINE NAME

The machine name can contain up to 15 characters. (Longer machine names will be truncated automatically to 15 characters.)

The MACHINE NAME command is necessary for some programs written to run under PC DOS. The name can include such identifier variables as %STATION. For more information about identifier variables, see "Identifier variables" on page 90.

MAP

Use MAP to map a drive to a directory on the network. Before you can work in a network directory, you must have a drive mapped to that directory.

Command format

MAP [option] [drive:=path]

Command options

MAP can be used to do a variety of things, depending on the options (variables) you include in the command format. These commands can be entered anywhere in your login script. The command formats, along with the different parameters you can use, are listed below.

MAP Displays the current drive mappings for all drives on the workstation. Undefined local drives (drives that have not been mapped to a directory) will not be displayed.

MAP drive:=directory Maps the specified drive to the given directory. *Directory* refers to the directory path, beginning with the volume name.

MAP drive:=drive: Maps the first drive to the same directory that the second drive is mapped to.

MAP drive:=directory; drive:=directory ... Maps multiple drives to multiple directories with one command. This command has the same result as executing the command MAP drive:=directory two or more times. *Directory* refers to the directory path, beginning with the volume name.

MAP INSERT search drive:=directory Inserts a new search drive using the next available letter in the search drive sequence. *Directory* refers to the directory path, beginning with the volume name.

MAP ROOT Maps a drive to a fake root directory. Some software applications write files to and read files from the root directory only. Because users do not have rights in the root directory, they cannot retrieve or write to files they create in those applications. NetWare allows users to map a drive to a fake root directory in which they have the rights they need.

MAP DISPLAY ON Displays your drive mappings when you log in. This is the default setting.

MAP DISPLAY OFF Does not display your drive mappings when you log in.

MAP ERRORS ON Displays MAP error messages (messages that report serious errors encountered while mapping drive assignments). This is the default setting.

MAP ERRORS OFF Does not display MAP error messages.

You can use MAP DISPLAY ON and MAP DISPLAY OFF anywhere in your login script; however, you must place MAP ERRORS ON and MAP ERRORS OFF before the drive mappings in your login script.

How to use MAP

When you use MAP to save drive mappings in your login script, you don't have to remap drives to directories every time you log in. This command is especially useful if you frequently use a number of directories and don't want to specify drive mappings for them every time you log in.

You can specify drive mappings in your login script by entering the same commands that you would enter if you were using the regular MAP command at the command line. These mappings will be displayed when you log in unless you have entered MAP DISPLAY OFF in your login script.

Your workstation has 26 logical drives (assigned letters A through Z) which you can use to map to directories in all areas of the network directory structure. Some of these logical drives will be assigned to local drives when you log in. Up to 16 of the 26 drives can be assigned as search drives.

When specifying drive names such as F or G, you can use an asterisk followed by a number n to represent the nth network drive.

For example, if your workstation has two local drives, A and B, then *1: maps to one of two drives: either the first drive beyond the drive specified by the LASTDRIVE command found in the CONFIG.SYS configuration file (see the DOS manual) or drive F if no LASTDRIVE = command is used. It is generally best to use the relative specification *n:; this allows you to log in from workstations with different local drive configurations.

Note: IBM-PC AT compatibles generally have five local drives by default (depending on the version of DOS you are using). You can override the default by using the LASTDRIVE command in your DOS CONFIG.SYS file.

You can map a local drive to a network directory, but you will not be able to access the local drive until you remove the network drive mapping. You can initially assign *1: to a user's home directory. Users can redefine *1: if they choose.

You should assign search drives in numerical order, beginning with S1:.

Example 1

If you include the following map command in your login script, drive F will be mapped to the SYS:SALES directory when you log in:

```
MAP F:=SYS:SALES
```

Example 2

If you include the following map command, your first network drive will be mapped to the SYS:SALES directory when you log in:

```
MAP *1:=SYS:SALES;  Q:=*1:TEST
```

Drive Q will be mapped to the subdirectory TEST relative to SYS:SALES (since you defined *1: to be mapped to the directory SYS:SALES).

Example 3

If you include the following map command, your first search drive will be mapped to the SYS:PUBLIC directory:

```
MAP SEARCH1:=SYS:PUBLIC
```

The MAP command and the shell descriptor area

When a workstation loads the NetWare shell, it passes the information in the descriptor area to the file server. Special identifiers are assigned to each descriptor in the shell descriptor area. The shell descriptor identifiers are listed below.

OS Assigned to the DOS-type descriptor.

OS_VERSION Assigned to the DOS-version descriptor.

MACHINE Assigned to the long-machine-type descriptor.

SMACHINE Assigned to the short-machine-type descriptor.

Assigning shell descriptor identifiers

You can use these identifiers within login script commands to modify your operating environment at the time you log in. Using these identifiers within the MAP command allows the file server to map a drive to the directory with the correct version of DOS.

If the MAP command is inserted into the system login script (or into each individual's login script), it should appear as follows:

```
MAP S2:=SYS:PUBLIC\%MACHINE\%OS\%OS_VERSION
```

The mapped drive must be a search drive so that DOS commands can be accessed from any directory on the network. The values for the identifiers come from the shell's descriptor area when the shell attaches to the file server during login.

For example, the following search path could be created using the MAP command shown above:

```
S2:=SYS:PUBLIC\COMPAQ\MSDOS\V4.00
```

The directory (indicated by the identifiers in the MAP command) should already exist, and the correct DOS version should be loaded in the directory, or login will not be completed successfully.

PASSWORD_EXPIRES

The PASSWORD_EXPIRES variable is used with the IF ... THEN command to let a user know how many days are left before his or her password is going to expire on the default file server.

How to use this variable

Include PASSWORD_EXPIRES in the login script with an "IF ... THEN" statement or with a "WRITE" statement, using any of the formats below:

```
IF PASSWORD_EXPIRES = VALUE "4" THEN WRITE "Your password
expires in 4 days."

WRITE "Password expires in %password_expires day(s)!"
```

When the user's password expires the user sees this message:

```
"Password for user _________ on server ___________ has expired."

"You have ___ grace login(s) left to change your password."

Would you like to change your password?  Y/N"
```

When the user logs in or attaches with the last grace login, this appears:

```
"Password for user _________ on server ___________ has expired."

"You have NO grace logins left to change your password."

"This is your last chance to change it."

"Enter your new password:"
```

PAUSE

Use PAUSE to create a pause in the execution of the login script.

Command format

PAUSE

or

WAIT

How to use PAUSE

You can add PAUSE to the login script following a message so that you will have time to read the message before it scrolls off the screen. If you include PAUSE or WAIT, the message

```
Strike a key when ready...
```

appears on the workstation screen. The login program then waits for a key to be pressed before it executes the rest of the login script.

Enter either of these commands in your login script at any point you want a pause to occur.

PCCOMPATIBLE

Use PCCOMPATIBLE to include a filename with the EXIT login script command on all computers that are IBM-PC compatible; you can also use it with computers that are not 100-percent IBM-PC compatible.

Command format

[PC] COMPATIBLE

How to use PCCOMPATIBLE

If your machine is an IBM-PC compatible but you have changed your long machine name in your SHELL.CFG file to another name (for example, COMPAQ) to access a different version of DOS, you must use the PCCOMPATIBLE (or COMPATIBLE) login script command to inform the login program that your machine is an IBM-PC compatible.

Enter the following anywhere before EXIT in the login script:

```
PCCOMPATIBLE
```

For example, if you are working on an IBM-PC compatible and you want to exit to SYSCON from within your login script, put the following commands in your login script:

```
PCCOMPATIBLE

EXIT "SYSCON"
```

REMARK

Use REMARK to insert explanatory text into your login script.

Command format

REM[ARK] [text]

or

* [text]

or

; [text]

How to use REMARK

Any text following REMARK (or REM), an asterisk (*), or a semicolon (;) will be ignored when the LOGIN command interprets and executes your login script. The remark will not appear on your screen.

Using remarks in your login script can make the script much easier for you to read and understand.

The REMARK command and its associated text must be the only entry on a line. Placing remarks on the same line as other script commands will cause errors when your login script is interpreted.

To add explanatory text to your login script, enter the following (or one of the other variants of the REMARK command) in your login script, entering the text you need in place of the text variable.

REMARK text

Example

The following are examples of explanatory text that you might use with the REMARK command:

```
* Sample Text

; assign OS-dependent Search mappings

REM  Check for new mail.

REMARK  Be sure to update the PROJECTS file.
```

SHIFT

Use SHIFT to shift the command line parameters to the next variable. This allows you to enter command line parameters in any order.

Command format

```
SHIFT [n]
```

Replace *n* with the number of places you want the command parameters to shift. The default is 1.

How to use SHIFT

When you enter the LOGIN command, you can include additional parameters. These parameters are assigned a %variable.

For example, suppose you enter the following LOGIN command:

```
LOGIN JAMES wp 386
```

The LOGIN parameter would be assigned %0. The username parameter would be assigned %1. The wp parameter would be assigned %2. The 386 parameter would be assigned %3. You have set up certain commands that are executed if these parameters are included at the command line.

If you also include SHIFT, the variables are assigned to the next parameter. In this case 386 would be assigned %2 and wp would be assigned %1.

```
If %1 = wp then ...

If %2 = 386 then ...

SHIFT
```

This allows you to include a number of different parameters in any order at the command line.

You can include a positive or negative number after SHIFT to move the variables in either direction. For example, SHIFT -3 would move the %variables 3 positions to the left.

WRITE

Use WRITE to customize your login messages.

Command format

WRITE [text string(s); ... identifier(s); ...]

How to use WRITE

You can enter a single command or include a list of text strings or identifiers separated by semicolons (;) after any WRITE command. Each message appears on a new line on your screen unless you place a semicolon at the end of the WRITE command line. Then multiple WRITE commands generate a one-line display.

Text strings must be enclosed in double quotation marks (" ") and can include the following super-characters:

\r for a carriage return

\n for a new line

\" for an embedded quotation mark

\7 to sound a beep

Compound strings

Compound strings are a general class of command arguments. A string is either a quoted sequence of characters or the value of an identifier (including environment variables). Strings can be combined into a single string using the following operators, highest precedence first:

; Concatenation

* / % Multiply, divide, modulo

+ - Add, subtract

>> << Shift (truncate) left or right; "1000" >> becomes "1"

Identifier Variable	Screen Display
HOUR	Hour of day or night (1-12)
HOUR24	Hour (00-23)
MINUTE	Minute (00-59)
SECOND	Second (00-59)
AM_PM	Day or night (am or pm)
MONTH	Month number (01-12)
MONTH_NAME	Month name (January, June, etc.)
DAY	Day number (01-31)
NDAY_OF_WEEK	Weekday number (1-7, Sunday=1)
YEAR	Year in full format (1990, 1991, etc.)
SHORT_YEAR	Year in short format (90, 91, etc.)
DAY_OF_WEEK	Day of week (Monday, Tuesday, etc.)
LOGIN_NAME	User's unique login name
FULL_NAME	User's full name (from SYSCON files)
STATION	Workstation number
P_STATION	Physical station (12 hex digits)
GREETING_TIME	Morning, afternoon, or evening
USER_ID	Number assigned to each user
FILE_SERVER	Name of the file server
NETWORK_ADDRESS	Internal network number of the file server
OS	The workstation's operating system
OS_VERSION	The version of the workstation's DOS
MACHINE	The machine the shell was written for, e.g., IBM PC
SMACHINE	Short machine name, e.g., IBM
ERROR_LEVEL	A value; for example, 0(no errors) or any number other than 0(errors)
MEMBER [OF] "GroupName"	Name of group

Identifier variables

The identifiers in the table above represent variable text information. (Enter them exactly as shown.) When the WRITE command is executed, the correct text is substituted and displayed on your workstation screen.

Note: Identifier variables can be used with the IF ... THEN command and the WRITE command. They can also be used with commands for which you can specify a pathname, such as COMSPEC.

You can use WRITE command identifiers in other login script commands if the identifiers are preceded by a percent sign.

These "identifier variables," as they are called, are replaced by their actual values before the script line is interpreted.

The value of any environment variable set by DOS can be accessed as an identifier by enclosing it in angle brackets. For example,

```
WRITE "my path is %<path>"

IF <INCLUDE> != "" WRITE "my include path is
";<include>
```

Note: Identifier variables can also be placed within literal text strings in a WRITE statement; however, the identifier name must be in uppercase letters and preceded by a percent sign.

For example, the following two lines would result in the same output:

```
WRITE  "Good "; greeting_time;  ", John"

WRITE  "Good %GREETING_TIME, John"
```

Identifier variables are extremely useful if you intend to use different PC operating systems concurrently on different network stations. Depending upon the operating system type, you can appropriately set search drive mappings and other OS-dependent mappings for the operating system you are using when you log in. Using identifier variables can provide a way to handle the different commands required by different machine types.

For example, if you are using PC-DOS 4.00, you could create a SYS:PUBLIC/IBM_PC/PCDOS/4.00 directory and place a copy of the appropriate COMMAND.COM in that directory. You could then create a similar directory for each different machine and operating system type. If your login script contained the following command, it would access the proper login command no matter which machine you execute LOGIN from:

```
MAP S2:=SYS:PUBLIC\%MACHINE\%OS\%OS_VERSION
```

Example

Suppose user Karl's login script contained the following WRITE commands:

```
WRITE "Hello, "; LOGIN_NAME

WRITE "This is station "; STATION
```

The following would be displayed when Karl logged in to station 16:

```
Hello, Karl
This is station 16
```

Organizing and accessing files

This section recommends how you should set up the directory structure on your hard disk, and how to install applications, assign file security, and create drive mappings.

Before setting up directories and files using procedures in this section, you should have installed the network hardware and software as discussed in *Installing and Maintaining the Network*, and booted the file server as discussed in "Managing the file server," and booted at least one workstation if you have a dedicated file server. You should have also logged in as SUPERVISOR, assigned a password to the SUPERVISOR account, and created a SUPERVISOR-equivalent user account with a password.

You should be familiar with the following topics found in *Concepts* before working with this section so that you can make the best use possible of the information found here.

Directory structure
Drive Mapping
Home directory
Maximum Rights Mask
Search drive
Security

Make copies of the "Directory Structure," "Trustee Directory Security," and "Trustee File Security" worksheets at the end of this manual to help you plan information that you will enter as part of the procedures discussed in this section.

Create the directory structure

We recommend that you create your directories following the pattern shown below. Fill out the "Directory Structure" worksheet (found at the end of this manual) while planning your directories. You may want to read through the items on the worksheet first and then fill in the worksheet in the order that makes the most sense for your situation.

Create the directories located at the highest level first, then directories at the next lower level, and so on, working from the top to the bottom of the directory structure.

1. **System-created directories.** The following directories are created automatically during network installation and cannot be deleted. You should also not change the trustee directory rights

assigned to these directories by default. These directories are already printed on the worksheet.

- SYS:SYSTEM contains the NetWare operating system files.
- SYS:LOGIN contains the programs used for logging in.
- SYS:PUBLIC contains NetWare utilities and programs for all network users.
- SYS:MAIL contains login scripts and other information specific to each user account.

2. **SYS:PUBLIC/*DOS Version*.** Create a unique directory in SYS:PUBLIC for every DOS version you use on your network. If you use both DOS 3.*x* and 4.*x*, create a directory for each. You could create, for example, the directories SYS:PUBLIC/DOS/V3.30 and SYS:PUBLIC/DOS/V4.00.

You cannot store multiple versions of DOS in a single directory; one will overwrite the other.

If you are storing machine-specific versions of DOS for different workstation types (Compaq or IBM, for example), be sure to create directories for each of them.

Use the MD command to create these directories. For example, at the DOS prompt, type

```
MD SYS:PUBLIC/DOS <Enter>
MD SYS:PUBLIC/DOS/V3.30 <Enter>
MD SYS:PUBLIC/DOS/V4.00 <Enter>
```

3. **SYS:PUBLIC/*application name*.** Create a separate subdirectory in SYS:PUBLIC for each of your applications. If you have, for example, both a word-processing application and an accounting application, you might plan and create two subdirectories in the PUBLIC directory and name them:

   SYS:PUBLIC/WORD_PRO

   SYS:PUBLIC/ACCOUNT

   Use the MD command to create these directories. At the DOS prompt, type

   ```
   MD SYS:PUBLIC/WORD_PRO <Enter>
   ```

   See "Install applications" on the next page for instructions to install your application files after creating the directories.

4. **Directories to match your business organization.** Create working directories for various projects along the lines of your existing business organization. Sketch out your organizational structure on paper, then create a directory structure on the "Directory Structure Worksheet" to match it. For example, your organization is probably broken down into departments and workgroups. Use the same structure for your working directories.

   Use the MD command or the FILER utility to create these directories. See "Subdirectory structure: create" in the Task List on page 227. For example, type the following to create directories for two projects.

   ```
   MD SYS:PROJECTS  <Enter>
   MD SYS:PROJECTS/PROJ_A  <Enter>
   MD SYS:PROJECTS/PROJ_B  <Enter>
   ```

5. **SYS:HOME/*username*.** Create a home directory for each network user if you want users to have their own personal workspace. Home directories could be assigned the first, last, or username of the user. For example, SYS:HOME/NANCY could be the home directory for user Nancy.

   You will have the option of automatically creating home directories for new users in "Managing users and groups," if you want to wait until you get to that section.

Install applications

After directories have been created, you can next install applications for the network. The program files for the application must be copied into the application directory you created, and file attributes must be set.

1. Copy the application files into the appropriate directory. If the documentation for the application has instructions for installing the application on a network, follow those instructions, then skip to Step 2.
   - For applications that have no instructions for installation on a network, see if there are instructions for installation on a hard disk.
   - If the installation requires that files be placed in the hard disk's root directory (the volume level in NetWare), you will need to map a fake root to an existing drive using the MAP command, so that these files can be accessed by the application.

For example, if the application requires that certain files be placed in the root directory, you can create an application directory such as SYS:PUBLIC\WORDPROC, then map a drive to the directory as a root as follows:

```
MAP ROOT G:=SYS:PUBLIC\WORDPROC  <Enter>
```

This command should be placed in the system login script to make it permanent.

- If the application requires installation on a specific drive, such as C or D, install the program in its directory, then create a map to that directory using that drive letter. For example, type

  ```
  MAP C:=SYS:PUBLIC\directory  <Enter>
  ```

  The following message will appear:

  ```
  Drive C: currently maps to a local disk.
  Do you want to assign it to a network drive? (Y/N) Y
  ```

  This command should be placed in the system login script to make it permanent.

2. Flag the application files as Shareable Read Only (SRO). The default flag attribute is Read Write, but you do not want users to be able to write over the application files. Use FLAG or FILER to change the file attributes to SRO.

3. Modify the workstation boot diskettes. If the application modifies or creates lines in the AUTOEXEC.BAT or CONFIG.SYS file, make sure that these lines are added to the appropriate files on the workstation boot diskettes.

Assign file security

If you were to allow all rights in all directories and subdirectories, users and group members would be able to access and modify all the information on the network. To prevent this from happening, assign attributes to files and modify the Maximum Rights Masks for directories as needed.

The Maximum Rights Mask of each directory initially allows all rights. Changes to the Maximum Rights Mask of a directory only affect that directory. Subdirectory Maximum Rights Masks remain unchanged.

Trustee rights are assigned to user or group accounts, and determine what a user can do in the specified directory. Only trustee rights allowed by the Maximum Rights Mask can be exercised in the directory. Trustee right assignments flow down through the subdirectory structure until they are redefined at another level.

See **Security** in *Concepts* for more information about directory attributes.

Do the following to plan and set directory rights, file and directory attributes, and user trustee rights.

1. Consider what general restrictions you want to impose on the information in each directory and file. For example, do you want to prevent users from writing to or deleting files from a certain directory?

   For each directory and subdirectory, decide if you want to limit any rights for all users by altering the Maximum Rights Mask. Remember that maximum rights limitations apply only in the directory where they are set.

   In the RIGHTS column of the "Trustee Directory Security" worksheet, list the rights you want all users to have in the directory. Unless you modify the Maximum Rights Mask, all directories you create will allow all rights.

2. Set the attributes for each directory that you want to restrict by using the FLAGDIR command line utility. See "FLAGDIR" in "Utilities reference" on page 333. For example, to set a Private attribute for Joe's home directory, type

   ```
   FLAGDIR SYS:HOME\JOE PR  <Enter>
   ```

3. Set the attributes for each file that you want to restrict using the FLAG command line utility. See "FLAG" in "Utilities reference" on page 331. For example, to set a Hidden attribute for the JOURNAL.TXT file in Joe's home directory, type

   ```
   FLAG SYS:HOME\JOE\JOURNAL.TXT H  <Enter>
   ```

4. Set trustee rights for users at the time that you create them. See "Managing users and groups" on page 117.

Plan login script drive mappings

There are three types of drive mappings: network, search, and local.

- Network drive mappings use the letters F through Z, and specify directories on the file server.
- Search drive mappings use the letters K through Z, starting with Z, and specify directories that are searched for applications or other executable files.
- Local drive mappings use the letters A through E, and specify local floppy and hard disk drives.

You can create standard drive mappings by including the MAP command in a login script. Plan the mappings here and enter them on the "Login script worksheet." When you return to "Logging in and out," enter the mappings in the system and user login scripts.

1. Plan all systemwide permanent drive mappings for the system login script.
2. Plan all systemwide permanent search drive mappings for the system login script.
3. Plan all user-specific permanent drive mappings and search drive mappings for individual user login scripts.

See "MAP" in "Utilities reference" on page 359 for MAP command options. See the tasks listed under "Drive mappings" in the Task List on page 175 for procedures. See **Directory structure** in *Concepts* for examples of different types of mappings.

Where to go from here

If you are doing an initial installation, go to the section "Managing users and groups."

Managing users and groups

This section recommends how to organize users and groups to make the most efficient use of your network.

Before setting up users and groups using procedures in this section, you should have installed the network hardware and software, set up the file server, set up workstations, logged in as SUPERVISOR, and organized and created the directory structure. All of these are discussed in previous sections of this manual.

You should be familiar with the following topics found in *Concepts* before working with this section so that you can make the best use possible of the information found here.

File server console operator
Groups
Printing
Security
Security equivalence
User

Make copies of the "Users," "Group," "User Defaults," "Trustee Directory Security," and "Trustee File Security" worksheets at the end of this manual to help you plan information that you will enter as part of the procedures discussed in this section.

Users

Plan user accounts

Before actually creating user accounts, you should plan the type of accounts that you want to create. Plan for the following types of users:

- **SUPERVISOR** This account was created automatically by the NetWare installation procedure, and has all rights for the entire file server. Set a password for the account after you logged in as SUPERVISOR in order to protect the account and the file server. See "Set SUPERVISOR password" on page 70.
- **GUEST** This account was created automatically by the NetWare installation procedure. Set a password (use SETPASS) for the account or delete the account to prevent unauthorized access to the file server.

- **Regular network users** Create these accounts for the individual people who work on the network. Assign users to groups or give them special privileges. The procedures are explained in this section.

Some regular network users may have additional responsibilities. These are as follows:

- **SUPERVISOR equivalent** A SUPERVISOR equivalent is a network user who has supervisory rights for the entire file server. We strongly recommend that you create a SUPERVISOR equivalent so that if you forget the SUPERVISOR password or the SUPERVISOR account becomes otherwise unusable, you will have another way to get into the server. You may want to assign this account to another user, or create a regular user account for yourself for your every day use that has SUPERVISOR privileges. It is always wise to have at least two ways for the SUPERVISOR to log into the file server.
- **User account managers** A user account manager is a regular network user who is assigned to be a manager over other users and groups.
- **Workgroup managers** A workgroup manager is a network user with the rights to create users, groups, and queues, and has supervisory rights over those users, groups, and queues that he or she created.
- **Console or queue operators** A console or queue operator is a network user with rights to perform SUPERVISOR-level tasks with FCONSOLE or PCONSOLE.

Plan user defaults

Before creating user accounts, you should plan and set up user account defaults. These default settings will be assigned to all user accounts as they are created. This saves you from having to enter the same information for every user account as you create it.

Using the "User defaults" worksheet, decide what settings you want to assign to new accounts for each of the following, then fill in the settings on the worksheet. These settings will be entered using SYSCON, as described below.

- **Account has Expiration Date** Decide whether the account will expire on a certain date. If Yes, enter the date that the account expires.

- **Limit Concurrent Connections** Decide whether to limit the number of stations that the user can be logged into the file server with simultaneously. If Yes, then enter the maximum number of connections that should be allowed.
- **Create Home Directory for User** Decide whether to automatically create a home directory for the user when the user account is created in SYSCON.
- **Require Password** Decide whether a password will be required for the user account. If Yes, then decide the minimum length of the password.
- **Force Periodic Password Changes** Decide whether the user will be required to periodically change the password on his or her account. If Yes, then decide how often, in days, the password must be changed. Also decide whether any grace logins will be allowed after the password expires and if Yes, how many.
- **Require Unique Passwords** Decide whether the user must enter a password different than passwords previously used when changing the password.
- **Account Balance** Enter the number of accounting units credited to the user's account by default when the account is created. If the Accounting feature is set up, user's use of file server resources will decrease this initial balance.
- **Allow Unlimited Credit** Decide whether the user will be allowed unlimited credit against the Account Balance. If Yes, then the Account Balance is effectively ignored. If No, then enter the Low Balance Limit; if the account balance drops below this limit the user cannot log in.
- **Limit Server Disk Space** Decide whether the user will be restricted in the amount of disk space he or she uses. If Yes, decide the maximum amount of space, in kilobytes, the user may use on the disk. This option will only be available if you specified limited disk space during installation.
- **Login Time Restrictions** Decide if there are certain hours of the day that the user should not be allowed to log in to the file server.

Plan user privileges

As the network supervisor, you are responsible for determining which users will have which privileges. Use the "Users," "Trustee Directory Security," and "Trustee File Security" worksheets in this manual to help you plan users. After you complete the worksheets, you will have a guide to follow as you create users and groups and make their trustee assignments.

Because security is crucial in a multiuser environment, NetWare allows network supervisors and users to control who can get into the network.

NetWare has three levels of security: login, rights, and attributes.

- **Login security** determines who is allowed access to the file server by requiring a login name and password. A supervisor can use SYSCON to specify various login restrictions, including whether passwords are required, when and from what station a user can log in, and so on.
- **Rights security** determines which directories and subdirectories a user or group can access, and what the user is allowed to do with the contents of those directories and subdirectories. Rights security is determined by trustee rights assignments and the Maximum Rights Mask. Rights can be assigned to a group as a whole instead of to each member of the group separately.
- **Attributes security** determines what things can be done with directories or files. Attributes are assigned to individual directories, and override the trustee rights granted to the user.

For more information on the three levels of security, see **Security** in *Concepts*. The three levels of security are applied to users and groups as they are created, as explained in this section.

Plan what rights will be assigned to individual users. There may be some trustee rights you will want to assign to some individual users and not to others.

1. On the "Trustee Directory Security" worksheet list all your directories. Then list each user or group in the spaces provided at the top of the worksheet.

2. For each user or group, go through the list of directories and fill in the trustee rights a user or group needs in each directory. Users should have all the trustee rights that they need in any directory to do their work but they should not be given unnecessary rights. Be careful also not to give them rights in areas that could compromise network integrity or

security. Do not change the restrictions that the system automatically created for the four system-created directories. See **Security** in *Concepts*.

3. Determine which users will be user account managers, workgroup managers, console operators, or queue operators. If the network is small you may not need assistance with user accounts, work groups, console, or queues. However, if the network is large, or if your organization's workgroups are structured in a way conducive to network workgroups, you will want to create these users.

Create regular users

You can create individual user accounts with the following utilities:

- MAKEUSER and USERDEF will allow you to create multiple user accounts at the same time. USERDEF will also allow you to create the user's home directory at the same time the account is created.
- SYSCON is used to create one user account at a time. It will allow you to create the user's home directory and add the user to a group at the same time the account is created.

Enter user defaults If you want a group of accounts to use one setting and another group to use a different setting, enter the default settings, create the first group of accounts, then change the default settings and create additional accounts.

Note: System default settings for account restrictions, station restrictions, and time restrictions are assigned to all users' accounts as these accounts are created. Changing the system defaults will affect only those accounts created after those changes are made.

Override system defaults by modifying the individual account after the account has been created.

Do the following to set up system defaults using SYSCON:

1. Enter SYSCON and select "Supervisor Options."
2. Highlight "Default Account Balance/Restrictions" and press <Enter>.
3. Enter default settings that will apply to all new users from the "User Defaults" worksheet. Press <Esc> to exit the screen.

4. Highlight "Default Time Restrictions" and press <Enter>.

5. Enter default time restrictions for new users from the "User Defaults" worksheet.

   An asterisk (*) specifies that the user is allowed to log in during that time period. Move the cursor using the arrow keys to a time period and press <Del> or the space bar to clear the asterisk, or press the asterisk key to add an asterisk.

   To mark a block of time, press <F5>, then move the cursor using the arrow keys. Then press <Del>, the space bar, or the asterisk key.

6. Press <Esc> to exit back to the main SYSCON menu. Continue with step 2 in the following to create users.

Create individual users Using the information on the "User" and "Trustee Directory Security" worksheets, create each user and assign trustee rights to each.

Do the following to create a user account using SYSCON.

1. Enter SYSCON and select "User Information."

2. Press the <Insert> key and enter the user's account name in the box that appears. Press <Enter>.

3. If the default setting automatically creates a home directory for each user, a screen will appear listing a suggested directory name in the format SYS:*username* for the user's home directory. Accept this name by pressing <Enter>, or enter a new name, then press <Enter>. You will be asked to verify the directory name. Select "Yes," then press <Enter>. The directory will be created.

Note: If you modify the path of the suggested directory, for example changing the path from SYS:*username* to SYS:HOME*username*, the suggested path for the next user account your create will be the path that you entered.

   If the default setting does not automatically create a home directory, you can create a home directory for the user by selecting the "Trustee Directory Assignment" option on the "User Information" menu and pressing <Insert>.

4. Highlight the new user's name and press <Enter>. The "User Information" menu will appear. Now you can set up user account restrictions, change the password, assign the user to groups, create the login script, and so on.

   Information on the "Account Restrictions" and "Time Restrictions" screens will default from information entered in the previous section, "Enter user defaults." If you need to change any default settings for this new account, go to these screens; otherwise, go right to the other screens.

   Account Balance Enter the number of accounting units credited to the user's account. If the Accounting feature is set up the user's use of file server resources will decrease this initial balance.

   Also specify whether the user will be allowed unlimited credit against the Account Balance. If Yes, then the Account Balance is effectively ignored. If No, then enter the Low Balance Limit; if the account balance drops below this limit, the user cannot log in.

   Account Restrictions Information on this screen defaults from information entered on the "Supervisor Options" screens. You can change the default settings for this account if necessary.

   Change Password Type in a password, press <Enter>, then type the password again to verify that it was correctly entered. Press <Enter>.

   Full Name Type in the full name for the user account and press <Enter>.

   Groups Belonged To This screen lists the groups that the user currently belongs to.

   Press <Insert> to add the user to a new group. Select a new group from the list of groups that the user does not belong to, then press <Enter>.

   Login Script Enter the commands for the user login script on the screen, then verify changes when you exit. See "Logging in and out" on page 69 for a description of valid commands and examples.

   Managed Users And Groups This screen lists the users and groups that this user manages.

Press <Insert> to add a new user or group. Select a user or group from the list that appears.

Managers This screen lists the users and groups that are currently managing this user.

Press <Insert> to add a new manager for this user. Select a user or group from the list that appears.

Other Information This screen displays statistical information about the user account. You cannot edit the information on this screen.

Security Equivalence This screen lists who the user has equivalent rights to. The screen displays the current security equivalent.

Press <Insert> to add a new equivalent, then select a user or group from the list that appears. To delete an equivalent, select the equivalent and press <Del>.

Station Restrictions Press <Insert>, then on the screen that appears, enter the network addresses and the workstation addresses of the workstations that the user may log in from. If no addresses are entered then the user may log in from any workstation.

Time Restrictions Information on this screen defaults from information entered on the "Supervisor Options" screen. You can change the default settings for this account if necessary.

An asterisk (*) specifies that the user is allowed to log in during that time period. Move the cursor using the arrow keys to a time period and press <Del> or the space bar to clear the asterisk, or press the asterisk key to add an asterisk.

To mark a block of time, press <F5>, then move the cursor using the arrow keys. Then press <Del>, the space bar, or the asterisk key.

Press <Esc> to exit the screen.

Trustee Directory Assignments This screen lists directories that the user has trustee rights in. You can add a directory, and add or delete rights that the user has in the directory.

To add a directory to the list of directories that the user will have trustee rights in, press <Insert>, then type in the name of the directory. Press <Enter>. If the directory does not exist you will be asked if you want to create it. If you don't know

the name of the directory, press <Insert> again then select volumes, directories, and subdirectories to specify the path.

To add rights for the user in the directory, highlight the name of the directory and press <Enter>. A list of the rights for that directory appears. Press <Insert>. A list of rights not yet granted will appear. Highlight the right (or multiple rights with the <F5> key) and press <Enter>. The rights will be added to the list of rights that the user has in that directory.

To delete rights that the user has in the directory, highlight the name of the directory and press <Enter>. A list of the rights for that directory appears. Highlight the right (or multiple rights with the <F5> key) and press <Del>. Select "Yes" to confirm the deletion. The rights will be deleted from the list of rights that the user has in that directory.

Volume/Disk Restrictions Specify if disk pace should be restricted, and if Yes, the maximum amount of space that the user should be allowed. The current space usage by the user is shown.

5. Repeat the above steps for each user you want to create.

Create user account managers

User account managers will have supervisory rights over the users that are assigned to them. Create these managers to assist you in administering user accounts only if you have a large network.

A user account manager is created by assigning users to another user who becomes the account manager.

Do the following to create a user account manager using SYSCON.

1. Enter SYSCON and select "User Information."
2. Highlight the user that you want to be the account manager.
3. Select "Managed Users and Groups" from the "User Information" menu or the "Group Information" menu. A list appears.
4. Press <Insert> to view a list of "Other Users and Groups."
5. Select the users and/or groups that you want to assign to the account manager.
6. Press <Esc> to exit.

Create workgroup managers

A workgroup manager has supervisory rights over specified directories or volumes.

Do the following to create a workgroup manager using SYSCON.

1. Enter SYSCON and select "Supervisor Options."
2. Select "Workgroup Managers" from the "Supervisor Options" menu. A list of existing workgroup managers appears.
3. Press <Insert> to add a new manager. A list of "Other Users and Groups" appears.
4. Select the user or group that you want to designate as the workgroup manager. The new manager will now appear on the "Workgroup Managers" list.
5. Press <Esc> until you return to the "Available Topics" menu.
6. Select "User Information," then select the user that you just set up as a workgroup manager.
7. Select "Managed Users and Groups." Press <Insert>. A list of users and groups appears. Select users and/or groups to be managed by the workgroup manager by highlighting a name and pressing <Enter>. Select multiple names using the <F5> key. The names will be added to the "Managed Users and Groups" list.

Create file server console operators

A file server console operator is a user or member of a group that has been given rights by the Supervisor to operate FCONSOLE.

To create a file server console operator, you must first log in as SUPERVISOR or have rights equivalent to SUPERVISOR.

Do the following to create a file server console operator using SYSCON.

1. Enter SYSCON and select "Supervisor Options."
2. Select "File Server Console Operators" to display the users and groups that are console operators.

3. Press <Insert> to add a new console operator. Select the name of the user or group to be a new console operator from the "Other Users and Groups" list.

Create print queue operators

A print queue operator is a user or member of a group who has been given rights by the Supervisor to edit or delete print jobs in the queue and otherwise modify the queue status. Queue operators are assigned for each individual print queue.

A print queue operator cannot be created until a print queue exists. Creation of print queue operators is discussed in "Using core printing."

Groups

Plan groups and security

After user accounts are set up, you should create groups to put the users into. All users are assigned to the group EVERYONE automatically; you can delete them from this group and/or assign them to other groups. Users are usually classified by the tasks they perform or the group of other users that they work with. Use the "Groups" worksheet in this manual to help you list the users that should belong in each group.

1. List all the people who will be using the network. If you have a group of users who need access to the same directories and files, create a workgroup for them. A single user can belong to several groups. For examples, see **Groups** in *Concepts*.

2. After you have decided on the groups, list each one on the "Trustee File Security" worksheet in the spaces provided for groups.

3. If you want to assign trustee rights in a particular directory to all users, assign those rights to the group EVERYONE. Users are automatically added to the group EVERYONE when they are created and will automatically be able to exercise those rights.

4. For each group you have created, go through the list of directories and fill in the trustee rights that group needs for each directory.

Ideally you will be able to assign almost all the trustee rights to groups.

Create groups

Use the SYSCON menu utility to create groups and to make trustee assignments for the groups. (You can add users to a group after the group is created.)

Do the following to create a group using SYSCON.

1. Enter SYSCON and select "Group Information."

2. Press <Insert> to create a new group. Enter the name of the group and press <Enter>.

3. Highlight the name of the new group and press <Enter>.

4. Select "Full Name" from the "Group Information" menu. Type in the full name of the group and press <Enter>.

5. Select "Trustee Directory Assignments." Press <Insert> and enter the name of the directory that you want to set trustee rights for in the "Directory in which Trustee Should be Added." Press <Enter>.

   If you are not sure of the directory name, press <Insert> and follow the prompts to select the volume, directory, and subdirectory names. Press <Esc>, then <Enter>. Read and File Scan trustee rights will be granted in the directory.

6. If you want to delete any rights, press <Enter>. Mark the rights you want to delete using the <F5> key. Press <Delete>, then confirm by highlighting "Yes" and pressing <Enter>.

   If you want to add any rights, press <Enter>, then <Insert>. Mark the rights you want to add using the <F5> key. Press <Enter>, then <Esc> to add the rights.

7. Repeat Steps 3 and 4 for each directory that you want to assign trustee rights for the group. Press <Esc> until you return to the "Group Names" menu.

8. Repeat Steps 1 through 4 for each group you want to create.

Add users to groups

After you have created groups, you must add users to the groups. This is done using the SYSCON utility.

Do the following to add a user to a group using SYSCON.

1. Enter SYSCON and select "Group Information."
2. Select a group and press <Enter>.
3. Highlight "Member List" from the "Group Information" menu and press <Enter>. The screen will list current members of the group.
4. To add new members to the group, press <Insert>. A list of users will appear. Mark multiple users (if desired) with the <F5> key or highlight a single user. Press <Enter>. Selected users will be added to the group.

Check security

After all users and groups are set up, the Supervisor can run the SECURITY utility to check for any holes in your security setup. At the DOS prompt, type

SECURITY <Enter>

This utility will check the security setup for all users and groups and report any possible problems. For example, the utility will tell you if any users have rights equivalent to SUPERVISOR or if any do not have passwords. You should then make whatever changes are necessary to correct those possible problems. See "SECURITY" in "Utilities reference" on page 420 for more information.

Where to go from here

If you are doing an initial installation, go to "Plan and create login scripts" on page 70.

Using core printing

This section tells how to use core printing on the network, including setting up printers and queues, and sending print jobs to the printer.

Once your file server is installed and set up, you are ready to begin printer setup.

Note: If you are using the printserver VAP for printing, the information in this chapter will not apply to you; see the *Print Server* manual instead. Only use this chapter if you specified that you would use core printing during installation. See **Core printing** and **Printing** in *Concepts* for a discussion of the difference between core printing and VAP printing.

You should be familiar with the following topics found in *Concepts* before working with this section so that you can make the best use possible of the information found here.

Print function
Print job configuration
Print mode
Printing
Serial communication

Set up your network for core printing

To prepare your network for printing, you must:

1. Create print queues.
2. Create print queue operators.
3. Define your printers.
4. Assign queues to the printers.

In addition, we suggest you create at least one spooler assignment so that you have a default print queue set up for the NPRINT and CAPTURE utilities.

To ensure that your printer definitions, queue assignments, and spooler assignments are not deleted when you down the file server, you can put the commands used to create these in your AUTOEXEC.SYS file; this is discussed on page 11. Use the same

command format and parameters in the AUTOEXEC.SYS file as you use entering the commands at the console.

Instructions for creating print queues, defining printers, assigning queues to printers, and creating spooler assignments at the console are explained in the following steps.

Note: You do not have to include the command for creating queues in the AUTOEXEC.SYS file. Queues are defined permanently as bindery objects and will not be deleted when the file server is downed.

Create print queues

1. At the file server console, type

   QUEUE queuename CREATE <Enter>

   Replace *queuename* with the name of the new queue. You may want to specify easily recognizable names for your queues. For example, you could have print queue names such as LASERJET and LINEPRINTER, or STUDENTS and ADMINISTRATION.

2. User SUPERVISOR is automatically assigned as a print queue operator, and group EVERYONE is automatically assigned as a print queue user. If these default assignments are not sufficient, you can change them using PCONSOLE. For more information about queue users and operators, see **Printing** in *Concepts*. Assignment of print queue operators is discussed below.

Create print queue operator

To create a print queue operator, you must first log in as SUPERVISOR or as a SUPERVISOR-equivalent user. Do the following to create a print queue operator using PCONSOLE:

1. Enter PCONSOLE and select "Print Queue Information."
2. Select the name of the queue that you want the new print queue operator to control.
3. Select "Queue Operators" from the "Print Queue Information" menu.
4. Press <Insert> to assign a new print queue operator. The "Queue Operator Candidates" list appears.

5. Select the users and/or groups that you want to be a print queue operator for the selected queue.

Define printers

To define the printers attached to the file server, you must select a printer number and specify whether the printing port is serial (COM) or parallel (LPT).

1. At the file server console, type

   PRINTER n CREATE port <Enter>

   Replace *n* with a number from 0 to 4, and replace *port* with COM*x* or LPT*x*.

   If you specify a serial port, a default configuration is installed with the following values:

Poll	15
Xon/Xoff:	No
Baud:	9600
Stop Bits:	1
Word Size:	8
Parity:	None

2. If you want to modify this configuration, see "PRINTER" in "Utilities reference" on page 406 for the command format.

When your printers are defined, you are ready to assign queues to the printers.

Assign queues to printers

We suggest you assign one queue to each printer to simplify your printing setup. However, multiple queues can be assigned to one printer. Likewise, one queue can be assigned to multiple printers.

If you assign more than one queue to a printer, you may want to assign it a priority level. For example, you can create a queue that will be serviced at a high priority ahead of other queues serviced by that printer. Or you may want to have one queue for each workgroup or department using a file server.

1. To assign an existing queue to a printer, type

   PRINTER n ADD queuename [[AT] [PRIORITY] nn] <Enter>

   Replace *n* with the printer number, replace *queuename* with the name of the queue, and replace *nn* with the priority number of the queue (optional).

Create spooler assignments (optional)

Spooler assignments have two main functions: to set up default print queues for NPRINT and CAPTURE and to support applications that send print jobs to printer numbers rather than print queues.

We suggest that you create at least one spooler assignment, so that an existing queue is assigned to the server as the default queue for the NPRINT and CAPTURE utilities. Then if a user prints with these utilities and does not specify a queuename in the command line, the job will still print via the default queue. The queue assigned with the SPOOL 0 command will be the default queue.

If you need more information on spooler assignments, see "SPOOL" in "Utilities reference" on page 434.

1. At the file server console, type

   SPOOL 0 queuename <Enter>

   Replace *queuename* with the name of the queue you want to assign the spooler to. Be sure to add *queuename* to a printer.

Where to go from here

If you will be printing primarily from applications designed for network printing, you must set up printing according to the instructions in the application's documentation.

If you will be using the NetWare utilities to print, go to "Customize Printing" on page 139.

If you need to modify your network printing setup—for example, to delete a printer—you can follow the instructions below. You do not need to down the file server or regenerate the operating system to modify your printing setup. To make permanent changes, add commands to the AUTOEXEC.SYS file; see "Customize booting with the AUTOEXEC.SYS file" on page 11. To make temporary changes, enter commands at the console.

If you are performing an initial network installation and have followed the process outlined in this manual, you should now have in place all the elements required. The rest of the sections in this manual contain network management information. Refer to the "Task List / Quick Path" for help with network management issues.

Core printing console commands

You can use the SPOOL, QUEUE, and PRINTER console commands to set up printing. They may also be entered in the AUTOEXEC.SYS file or on the command line. The following charts show the options that can be used with these commands. These commands are also explained in "Utilities reference" in this manual.

If you are using NetWare Name Service (NNS) you should not use the PRINTER or QUEUE commands; use the PCONSOLE utility instead. See the PCONSOLE tasks in the task list.

The SPOOL command

The SPOOL command is used to work with spooler assignments.

SPOOL command	Function
S[POOL]	Lists spooler assignments. No assignments will be listed until you have made a spooler assignment using the command explained below.
S[POOL] *nn* TO QUEUE *queue_name*	Sets up a spooler assignment. Replace *nn* with a spooler number (0 to 5). All print jobs spooled to spooler *nn* will be sent to the specified queue and printed by the printer servicing the specified queue.

You can also use this command with applications that can only print to printer numbers and not queue names, and to set up a default queue for printing with NPRINT and CAPTURE; assign the queue to spooler 0.

For example, you could include the following spooler mappings in the AUTOEXEC.SYS file:

```
SPOOL 0 printq_0
SPOOL 1 printq_1
SPOOL 2 printq_2
```

The QUEUE command

The QUEUE command is used to work with print queues.

Queue command	Function
Q[UEUE]	Lists all print queues, including the queue name, number of jobs in each queue, and number of printers servicing each queue.
Q[UEUE] HELP	Presents a summary of the available QUEUE commands.
Q[UEUE] *name* CHANGE JOB *nn* TO PRIORITY *xx*	Changes job priority in a queue. Use priority 1 to move a job to the beginning of the queue or specify a number greater than the number of jobs in the queue to move the job to the end of the queue.
Q[UEUE] *name* CREATE	Creates a new print queue. When the queue is created, the group EVERYONE is given rights to use the queue, the supervisor is given operator rights to the queue, and the file server is given rights to service the queue. After you create a queue, you must add the queue to a printer with the PRINTER ADD QUEUE command. You must also create a spooler assignment to the new queue.
Q[UEUE] *name* DELETE JOB *nn* /*	Deletes one or more jobs in a queue. You can specify a single job for deletion using the job number or you can specify all jobs for deletion by using an asterisk.
Q[UEUE] *name* DESTROY	Destroys a print queue and all jobs in the queue. You cannot recover either the queue or the jobs that were in it.
Q[UEUE] *name* JOBS	Lists queue contents, including each job's priority, the user who sent the job, the filename and job number, and the number of copies being printed.

The PRINTER command

The PRINTER command is used to control printers and print queues.

Printing command	Function
P[RINTER]	Lists all printers attached to the file server. It includes status (on- or off-line), form number mounted, and number of queues serviced.
P[RINTER] HELP	Lists printer commands available at the file server console.
P[RINTER] *nn* ADD QUEUE *name* AT PRIORITY	Adds queue to printer. (You must create the queue first.)
P[RINTER] *nn* CONFIG	Displays a printer's configuration.
P[RINTER] nn CREATE device [Baud=x] [WordSize=x] [Parity=x] [XonXoff=x] [Stopbits=x] [Poll=x]	Modifies a serial printer's configuration. To use the defaults, do not specify any settings. You change only the settings that you specify. Unspecified settings remain unchanged. Baud, Wordsize, Parity, XonXoff, and Stopbits are valid only for serial printer. Poll may be used for either serial or parallel ports.
P[RINTER] *nn* CREATE *device*	Creates a printer process. Replace *device* with a port (LPT1, COM1, etc.).
P[RINTER] *nn* DELETE QUEUE *name*	Temporarily removes a queue from set of queues being serviced by a printer. To remove a queue permanently, use SYSCON to remove the corresponding PRINTER command from the AUTOEXEC.SYS file.
P[RINTER] *nn* FORM FEED	Advances paper in printer by one page. Use with FORM MARK to correctly position forms in the printer.
P[RINTER] *nn* FORM MARK	Marks top of form in printer. Use with FORM FEED to correctly position forms in the printer.
P[RINTER] *nn* MOUNT FORM *x*	Changes form type mounted in printer. Form numbers are defined in PRINTDEF.
P[RINTER] *nn* POLL *x*	Sets printer polling period. The polling period specifies the amount of time the printer monitoring process waits before checking print queues for print jobs. The default is 15 seconds; you can specify from 1 to 60 seconds. This is the same as the PRINTER CONFIG POLL = x command.
P[RINTER] *nn* QUEUE	Lists printer's queues and their priority levels.
P[RINTER] *nn* REWIND *x* PAGES	Rewinds printer. Specify 0 to reprint starting with the current page. Do not specify a page number to reprint the entire job. If you specify a number greater than 9, if the file is not an ASCII file, or if the printing file contains no form feeds, the entire job will be reprinted. (You do not need to stop the printer to rewind.)
P[RINTER] *nn* START	Starts printer after you have used the STOP command.
P[RINTER] *nn* STOP	Stops printer.

Print files

When you have set up your network printers and print queues, you can print files from any application, or you can print text files and screen displays with the NetWare printing utilities.

Printing from applications designed for network printing

Many applications are designed for network printing. The application documentation will describe how to connect its print services to the network print services.

As you set up printing for an application, remember that NetWare sends print jobs to print queues rather than to printer numbers. If the application you use asks you to specify printer numbers, you must set up spooler assignments at the file server console.

Printing from applications not designed for network printing

If you are using applications that are not designed for network printing, you can use NetWare's CAPTURE, ENDCAP, NPRINT, and PCONSOLE utilities to print. Each utility is explained in the "Utilities reference" section of this manual.

Printing text files

Use NPRINT and PCONSOLE to print ASCII text files. NPRINT is a command line utility, so you must specify parameters at the command line. PCONSOLE is a menu utility and allows you to select files and parameters from a menu.

Printing screen displays

Use CAPTURE and ENDCAP to print screen displays. CAPTURE redirects any print commands issued to a local printing port and sends them to a print queue to be printed. ENDCAP ends the CAPTURE command and directs print commands back to the local workstation printing ports.

Customize printing

These instructions are primarily intended for users who will use applications not designed for network printing. If your application does not print to network printers, you must use the NetWare printing utilities to print. You can simplify printing with NetWare utilities.

Customize with PRINTDEF and PRINTCON

PRINTDEF and PRINTCON can simplify printing with CAPTURE, NPRINT, and PCONSOLE. We suggest you use PRINTDEF and PRINTCON in two cases only:

- If you are having problems with your printer resetting to default fonts when you use different printing setups.

  For example, if you are printing spreadsheets and letters on the same printer, you may have some problems with the printer resetting after each print job.

- If you want to specify different forms or print configurations when you are using CAPTURE, NPRINT, and PCONSOLE.

PRINTDEF creates a database that stores print device definitions (print devices are equipment used to print, such as printers and plotters) and form definitions.

You can set up a print device definition file for each printer you use. The definition file issues specific commands to the printer at the beginning of a print request. You can also set up a list of the types of forms you use on the printer.

PRINTCON uses the information set up in PRINTDEF to create customized print job configurations. A print job configuration controls the way a job is printed.

A primary advantage of setting up print job configurations is that users can choose a print job configuration instead of manually entering all the print job specifications each time they want to print with PCONSOLE, CAPTURE, or NPRINT.

Define print device definition files

You can define print devices in three ways:

- You can set up a print device definition that is not included in those provided with NetWare.
- If you have access to print device definitions set up on another file server, you can copy them to your file server.
- You can copy the print device definitions you need from the 30 definitions provided with NetWare.

NetWare includes print device definitions for the printers listed below. The print device definitions are automatically placed in the SYS:PUBLIC directory when you install NetWare.

Apple Imagewriter II
Apple Laserwriter II/Plus
Citizen 120-D
Citizen 20
Citizen 224
CItoh 310/315
CItoh 600
Diablo 630
Epson FX80/FX100
Epson FX-800
Epson FX86e/FX286e
Epson LD-2500
Epson LQ-800/LQ-1000
Epson LX-80
Epson LX-800
Hewlett-Packard LaserJet I/II
IBM ProPrinter 4201
IBM ProPrinter II/XL
NEC Spinwriter 2050/3050
NEC Spinwriter 8810/8830
NEC Pinwriter P-6
Okidata Microline 192/193
Okidata 290
Okidata 390
Okidata Laserline 6
Panasonic 1080/1080i
Panasonic 1091/1091i
Star NX-1000
Star Gemini 10X
Toshiba P321

The print device definitions are files that have a .PDF extension. For example, the definition file for the Hewlett-Packard LaserJet printer is HPLASER.PDF.

To copy any of the 30 print device definitions, you must log in as SUPERVISOR and complete the following steps.

1. Enter PRINTDEF and select "Print Devices" from the "PrintDef Options" menu.
2. Select "Import Print Device."
3. If you are not in the SYS:PUBLIC directory, use the Backspace key to erase the current directory name. Then type the directory name, SYS:PUBLIC, and press <Enter>.
4. In the "Available .PDFs" list, select the .PDF file you want to add to your PRINTDEF list of files.

   If you try to copy a file that has the same name as an existing print device definition, the "New Device Name" entry box appears, prompting you to rename the new print device definition. Type the revised name and press <Enter>.

   The new print device definition is added to the print definition database. You are returned to the "Print Device Options" menu.
5. Repeat Steps 2 through 4 for each .PDF file you want to add.

   When you have finished selecting .PDF files, press <Esc> to return to the "PrintDef Options" menu.

Define the forms your printer uses

Print forms are the types of paper you print on. You can specify what form you want to print on when you set up print job configurations. For example, you might want some jobs to be printed on letter-size sheets of paper and others on green-bar continuous-feed paper.

NetWare recognizes forms by name and number. For your convenience, PRINTDEF assigns form names to the form numbers. When you send a print request that requires a specific form, the file server will not print the job until that form is mounted in the printer.

To define print forms, complete the following steps.

1. In the "PrintDef Options" menu, highlight "Forms" and press <Insert>.

2. Type the name of the new form you want to define in the "Forms Definition Form" entry box and press <Enter>.

   The first character of the form name must be alphabetic, and the form name cannot exceed 12 characters. An underscore (_) is automatically inserted between words instead of spaces. Examples of form names include White_8x11, Continuous, Checks, Green_Bar, Normal, and Standard.

   a. Type the number you want to assign to the form and press <Enter>. You probably want to assign the most commonly used form as form 0, since 0 is the default form. Form numbers must fall between 0 and 255.

   b. Type the length of the form in lines per page and press <Enter>. The number must fall between 1 and 255. This number is for your reference only. Use a number that makes sense to you. For example, if your printer is set to six lines per inch and your paper measures 8.5 by 11 inches, you might select 66.

   c. Type the width of the form in characters per line and press <Enter>. The number must fall between 1 and 999. This number is for your reference only. Use a number that makes sense to you. For example, if your printer is set to ten characters per inch and your paper measures 8.5 by 11 inches, you might select 85.

3. To save changes, press <Esc>. Then answer "Yes" to the "Save Changes" confirmation box by pressing <Enter>. The new form is listed in the "Forms" list.

4. Repeat Steps 2 and 3 for each form you want to define.

   If you need to edit a form, highlight that form in the "Forms" list and press the Modify key (<F3> on most computers). Follow Steps 2 through 4 to make any necessary changes.

   To delete a form from the "Forms" list, highlight that form and press <Delete>. Press <Enter> to confirm your decision to delete the form.

5. Exit PRINTDEF by pressing <Esc> twice and then <Enter> to access the "Exit Options" menu. Select "Save Data Base, then EXIT."

Set up print job configurations

You can set up a print job configuration by specifying certain parameters. You use these print job configurations as a shortcut when using NPRINT, CAPTURE, and PCONSOLE. You can use the "J=*printjob*" flag with NPRINT and CAPTURE or specify which print job you want to use on the PCONSOLE print form.

The first print job configuration you create becomes your default. When you define other configurations, you can specify a different default configuration.

Each user has a separate PRINTCON file. You can set up a print job configuration for one user and then copy it to other users' mail directories, or you can allow users to set up their own print job configurations.

To set up a print job configuration, complete the following steps.

1. Enter PRINTCON, and select "Edit Print Job Configurations."

2. Press <Insert>, and type the name of the print job configuration you want to add in the "Enter New Name" entry box. Then press <Enter>.

   For example, you might want to set up a print job configuration to print a monthly report that requires special formatting. You could name the print job configuration MONTH.

   The "Edit Print Job Configuration" form is displayed in a format similar to the following.

```
Edit Print Job Configuration "Jordan's_format"

Number of copies:  1          Form name:      CONTINUOUS
File contents:     Text       Print banner:   Yes
Tab size:          8          Banner name:    SUPERVISOR
Suppress form feed:No         Banner file:
Notify when done:  Y

Local printer:     1          Enable timeout:No
Auto endcap:       Yes        Timeout count:

File server:       CASSANDRA
Print queue:       LASERJET_Q
Print server:      GRACIE
Device:            HP LASERJET
Mode:              (Re-initialize)
```

To make changes in the job configuration, select the item you want to modify and make the appropriate change. Press <Enter> to save the change. For a complete explanation of each item, press <F1> (Help).

3. Once you have set up your print job configuration, press <Esc> and select "Yes" to save the changes. If you want to copy this print job configuration to other users, go to the next section. If not, you have finished customizing your printing environment.

Copy print job configurations

Each user has a unique print job configuration file that will store any print job configurations created by or for that user. This file, PRINTCON.DAT, is stored in the user's mail directory.

You can copy print job configurations from one user to another. You cannot copy a single job configuration at a time. You must copy the whole file, including all job configurations. When you copy one user's print job configuration file to another user's file, the copied file overwrites the existing file.

Since users can create their own print job configurations, be sure to check with users before copying a PRINTCON.DAT file over their existing files.

Note: If you have just finished creating or editing print jobs, you have to exit PRINTCON and save your current print job information before copying it to other users' directories.

To copy a print job configuration, log in as SUPERVISOR and complete the following steps.

1. Enter PRINTCON and select "Copy Print Job Configurations" from the "Available Options" menu.

2. Type the name of the user whose job configuration file you want to copy in the "Source User" entry box, and press <Enter>.

3. Type the name of the user whose print job configuration file you want to replace in the "Target User" entry box, and press <Enter>. The file is copied.

4. Press <Esc> to exit PRINTCON. The second user can now use the first user's print job configurations.

Managing accounting

This section tells you how to set up and manage the network accounting features. Deciding charge rates, billing accounts, and adjusting account balances are all explained.

Before setting up accounting using procedures in this section, you should have installed and booted the file server, and logged in as SUPERVISOR. These procedures are discussed in the previous sections of this manual.

You should be familiar with the **Accounting** entry in *Concepts* before working with this section so that you can make the best use possible of the information found here.

Set up an accounting server

As supervisor you can authorize servers to charge for services they provide, or revoke the right to charge. Only your current file server will be authorized to charge for services unless you add other servers.

If you add other servers to your network, such as job servers, gateways, print servers, archive servers, SNA gateways, or remote bridges, you can authorize them to charge for their services also. To include these additional servers in the list of accounting servers, you will need to create an account for each server. The software that comes with the server should include instructions for creating an account.

As long as the type of server you have is recognized by SYSCON, you can use SYSCON to authorize the server to charge for services. (If your server is not recognized by SYSCON, use the software included with the server to authorize it to charge.)

1. At the DOS prompt, type

   SYSCON <Enter>

2. Highlight "Accounting" and press <Enter>.

3. If accounting has not yet been installed, you will be asked if you want to install it. Select "Yes." This will install accounting on the file server and automatically create an account for the file server, authorizing it to charge for services. (Options on the Accounting menu will appear only if accounting has been installed.)

4. Highlight "Accounting Servers" and press <Enter>. A list will appear, showing all servers that are currently authorized to charge for services. If the desired server is already set up for accounting, press <Esc> to exit.

5. To add a new server to the list of accounting servers, press <Insert>. The "Select Server Type" list appears, showing the types of servers on the current file server. (If all servers are already authorized to charge for services, you will see a message to that effect.)

6. Select the type of server you want to authorize to charge and press <Insert>.

7. In the "Other Servers" list, select the server you want to authorize to charge, or use the <F5> key to select multiple servers.

8. Press <Esc> to exit.

Manage accounting charges

Monitor the file server and calculate charges

Before you can enter charges you must determine the amount of money that needs to be charged for file server resources. This is done by first deciding what the operating costs of the system are, then finding out how much the file server is being used. If you plan to charge users for services provided by the file server, you need to calculate the amount to charge. The amount you charge depends on your network environment.

Complete the following steps before setting or modifying charge rates for services:

1. Determine what your operating costs are and the amount of those costs you want to recover over a given period of time.

Note: The charge rate you choose is arbitrary. If you use a charge rate that is not effective, you can change the rate at any time.

---

2. Determine what services you will charge for and the costs you expect to recover from each service.

3. Determine how much the file server is being used by monitoring its use over a period of a few weeks.

a. Begin by assigning a charge rate of 1/1 for "Disk Storage" and "Connect Time." Use 1/1 so that you can see the actual units of storage or time used. This charge rate is for monitoring purposes only and will not affect actual rates.

b. Monitor your file server for two or three weeks to determine how much each service is being used.

c. At the end of the monitoring period, use ATOTAL to see total usage for each service. ATOTAL shows a list of the total daily and weekly usage of each service. You can also use PAUDIT to view a summary of accounting records. See "ATOTAL" on page 251 and "PAUDIT" on page 388 in "Utilities reference" for instructions on the use of these utilities.

4. After you have determined how much file server resources are being used, use those figures to determine how you will charge for those resources.

5. Start with the total amount you want to charge for each service, and divide by how much that service is used. Use the result for the charge rate for each service.

   Use the following formula to calculate a charge rate. See **Accounting** in *Concepts* for more information on charge rates.

$$\frac{\text{(Total charge for service)}}{\text{(Estimated total usage of service)}} = \frac{\text{(Charge rate multiplier)}}{\text{(Charge rate divisor)}}$$

Assign charge rates

After determining how much you will be charging for file server resources, enter the charges into the system. The following charges can be set up:

- **Blocks read** The number of blocks of data read from the file server's disk drives. A block is 4096 bytes.
- **Blocks written** The number of blocks of data written to the file server's disk drives
- **Connect Time** The amount of time, in minutes, that the user is connected (logged in) to the file server

- **Service Requests** The number of requests for service, such as disk searches, made by the user
- **Disk Storage** The number of blocks used to store the user's files per day

The Blocks Read, Blocks Written, Connect Time, and Service Requests charge rates are entered in a similar manner. Disk Storage charge rates are entered slightly differently.

1. Enter SYSCON and select the "Accounting" option from the "Available Topics" menu.

2. To set charge rates for each of Blocks Read, Blocks Written, Connect Time, and Service Requests do the following:

   a. Select the type of charge rate you want to enter from the Accounting menu.

   b. On the screen that appears, define a charge rate to be applied to each time period. To select a single time period (hour), move the cursor to that position. Press <Enter>.

      To highlight a block of time periods, use the arrow keys to move the cursor to the top-left corner of the block, press <F5>, then move the cursor to the bottom-right corner of the block. Press <Enter>.

   c. Select "Other Charge Rate." Enter the charge rate for the selected time period or block of time periods. Press <Enter>.

   d. Repeat Steps b and c for other time periods or blocks of time periods. Press <Esc> to exit the screen.

3. To set charge rates for Disk Storage, do the following:

   a. Select "Disk Storage Charge Rates" from the Accounting menu. On the screen that appears, define a charge rate per block/day of disk storage, and the day and time that the charge will be calculated and added to the user's account.

Note: Disk storage charges are intended to be charged once a day or week. The accounting feature assumes that the disk space used by a user at a given time of the day or night is a representation of the amount of space continually used by the user.

---

   b. To select a time period (hour), move the cursor to that position. Press <Enter>.

c. If a charge rate has already been defined, you may select it, or you may select "Other Charge Rate." Otherwise, define a "New Charge Rate" as prompted. Press <Enter> when done.

d. Repeat Steps b and c for other time periods. Press <Esc> to exit the screen.

Note: There is a maximum of 20 disk time charge entries.

Set up user account balances

The final step in setting up accounting is to give each user an account balance. The use of file server resources will be billed against this account balance every few minutes.

You can set up default account balances and restrictions using "Supervisor Options" in SYSCON. These defaults will be applied to all new user accounts as they are created. (Defaults do not modify existing accounts.) See "Managing users and groups" on page 117. If you want to set up or modify account balances and restrictions for existing user accounts, do the following.

1. Enter SYSCON and select "User Information" from the "Available Topics" menu. The "User Names" list appears.

2. Select the user or users whose account balance(s) you want to set. (Use the <F5> key to mark multiple users.) If you specified a single user, the "User Information" menu appears. If you selected multiple users, the "Set User Information" menu appears.

3. Select "Account Balance." The account balance window for the user(s) appears. (This option is only visible if accounting has been installed on the server.)

4. In the first field, set the account balance for the selected user(s). This balance is in arbitrary accounting units, not monetary units (such as dollars or cents). File server use is billed against this balance.

5. In the middle field, enter either "Yes" or "No" to specify if the user(s) will have unlimited credit. If "Yes" then the user(s) may use server resources as much as they like without an accounting restriction. If "No," the user(s) cannot log in if their balance goes too low.

6. If you did not allow unlimited credit, enter the low balance in this field.

If the user goes below this account balance, login restrictions will apply. The user will have to reconcile the account with the system Supervisor in order to be able to log in again. After the user reconciles the account with the system Supervisor, the Supervisor adjusts the user's account balance so that the user can log in again.

Use ATOTAL and PAUDIT to calculate charges for all users, or look at each individual's account balance using SYSCON. If users are set up with restricted balances (they do not have unlimited credit), then check account balances regularly so that users are not locked out of their accounts.

Remove the accounting feature

If you no longer want to allow a server to charge for its services, you must delete the server from the "Accounting Servers" list. You can delete one or all accounting servers. If you delete all the accounting servers, you also have the option to remove the accounting feature altogether.

1. Enter SYSCON and select "Accounting" from the "Available Topics" menu.

2. Select "Accounting Servers." A list of the accounting servers appears.

3. Highlight the name of the server you want to delete from the accounting system. Use the <F5> key to mark multiple servers to delete.

4. Press <Del> to delete the server(s). You will be asked to verify whether you want to remove accounting from that server. Press <Enter>.

5. Press <Esc>. You will be asked if you want to remove accounting. Select "Yes" and press <Enter>.

Customizing network menus

This section tells you how to create custom menus for use with the network. How to plan menus and specify menu colors is also explained.

Before customizing menus using procedures in this section, you should have installed and booted the file server, and logged into a workstation as SUPERVISOR. These procedures are discussed in the previous sections of this manual.

Create the menu text file

NetWare allows you to create customized menus and run them using the MENU command line utility. You can create your own menus using a text editor, specifying the applications or commands you want included on the menu, the placement of the menu on the screen, and the color palette to use.

Begin by deciding what commands and application you want to appear on your menu, whether they should all appear on the same menu or if you want to place some on submenus, where you want the menu to appear on the screen, and what color you want the menu to be.

The menu text file can be created with COPY CON or a text editor. Save the file in the directory that will be the user's current directory when the menu is started.

1. On the first line, type a percent sign, the title of the menu, and numbers specifying the number of lines from the top of the screen to the center of the menu, the number of character spaces from the left side of the screen to the center of the menu, and the color palette used. For example,

   ```
   %Fred's Menu,10,20,3
   ```

   will create a menu titled "Fred's Menu," place it so that the center of the menu is 10 lines from the top of the screen and 20 character spaces from the left side of the screen, and use color palette #3. Entering zeros for either the horizontal or vertical positions will center the menu in that direction on the screen. For example:

   ```
   %Fred's Menu,0,0,3
   ```

To use the default positions and palette, enter only commas. For example:

```
%Fred's Menu,,,
```

2. On the next line enter the options for the main menu. The line of text for the main menu option should be entered in the menu text file without anything preceding or following it. For example, to create a menu option that says "Mail", enter

   ```
   Mail
   ```

   a. If the main menu option is a command, on the next line indented two or three spaces, enter the command exactly as it would be entered on a DOS command line; this is the command that will be executed when the menu option is chosen. For example, the "Mail" menu option must be followed by a line that specifies the "MAIL" command:

      ```
      Mail
        mail
      ```

      When this menu option is selected by the user, the command following it is executed.

Note: If you put the "Logout" command in the menu script it must be preceded by an exclamation mark (!). A command preceded by an exclamation mark will close all files that were opened by the MENU command.

---

   b. If the main menu option calls a submenu, enter on the next line indented two or three spaces a percent sign (%) followed by the submenu name. For example:

      ```
      Applications
        %Applications
      ```

      When this menu option is chosen, the menu defined under it will appear.

   c. At the end of the options and commands for the main menu, define the submenu in the same way. For example, the "Applications" submenu must be defined later in the menu text file:

      ```
      %Applications,15,10,0
      WordPerfect
        wp
      dBase III
        dbase
      ```

3. Continue entering main menu options and commands and submenu options and commands in the same manner until the menu is complete. An example of a completed menu script appears on page 156.

Remember the following while entering menu titles, options, and submenus:

- **Menu titles** are always entered flush with the left margin, preceded by a percent sign (%), followed by the vertical position, horizontal position, and color palette number.
- **Menu options** are always entered flush with the left margin.
- **Menu commands** are always entered on the line following the menu option that executes them, and are indented two or three spaces.

The MENU utility will automatically alphabetize the menu options when it prints the menu on the screen. If you want the options in a certain order, place a number in front of the option text.

Using special characters The at sign (@), percent sign (%), and quotation mark ("") characters are used by MENU for programming purposes. If you include these in your menu options, then MENU will try to interpret them as special characters unless you precede each by a backslash (\) character. For example, to include "@50%" in the title of a menu option, you would need to write as follows:

```
\@50\%
```

Entering a second backslash (\\) allows you to use a backslash as part of the text.

Including variables You might want to include some commands on your menu that require additional instructions. For example, you might want users to be able to copy files from one destination to another using the menu. If this is the case, you need to include the COPY command in your text file. The COPY command might include several parameters that specify the file being copied, the file's source directory, and the file's destination directory.

Using the parameters for the command forms a text string that displays the commands one after the other. Each value in a command string that a user must specify (such as a destination drive or a filename) is called a variable. In the following example, the variable @ will become whatever value the user enters for the source drive, for example, A:, B:, or C:.

```
copy @"Enter Source Drive"
```

You can use some variables as repeaters by numbering the variables (such as @1, @2, or @3).

Once you assign the value of a variable in a command string, you do not need to repeat the assignment again. Every time you include that variable in the command string, it automatically keeps the same value.

The following command string illustrates the use of repeater variables.

```
COPY
 COPY @1"Enter source drive/filename"@2"Enter destination"
 DIR/W @1
 DIR/W @2
 PAUSE
```

Using this command string, the program will copy a file from one drive (directory) to another and then display a directory listing for each drive.

This process is explained below.

1. The variable @1 displays the message "Enter source drive/filename" on the screen.

2. The user enters the source drive and filename (for example, C:\GEORGE) and presses <Enter>.

3. The variable @2 displays the message "Enter destination" on the screen.

4. The user enters the destination drive (for example, G:) and presses <Enter>. This creates a string for the menu system: COPY C:\GEORGE G:.

5. The COPY command then copies the file GEORGE from drive C to drive G.

6. The program then proceeds to the next command in the string, DIR/W, which is the command used to display a directory listing of the source drive.

7. Before it can execute this command, the program must know which drive to list. Because the variable @1 is included after the DIR/W command, the program knows that it should use the same value for @1 that was specified earlier for "Enter source drive" (drive C). Therefore, the user does not need to enter a drive letter.

8. The program displays a directory listing of only the file GEORGE on drive C. Because a filename was specified in the @1 variable, only that file is displayed.

9. The program then displays a directory listing of the destination drive (from the DIR/W command). To complete this command, the program again needs to know which drive to list. Because the variable @2 is included after the second DIR/W command, the program knows that it should use the same value for @2 that was specified for "Enter destination" (drive G). Therefore, the user does not have to enter the drive letter.

10. The program displays a directory listing of drive G.

11. When the user presses any key, the program continues.

Whenever the program encounters a new command in the text file, variables are assigned new values. (Any command that is not indented in the text file script is viewed as a new command, and the program disregards previous variable values.)

For example, the following script specifies different values for the variables in each command.

```
COPY DIR
  copy @1"Enter source drive"*.* @2"Enter destination"
  dir @2
DIR-CHKDSK
  dir @1"Enter drive you want directory of"
  chkdsk @1
  PAUSE
```

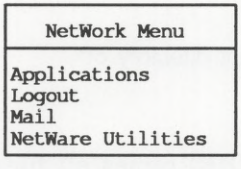
The first command (COPY DIR) copies all files from the default directory of one drive to another drive and then displays a directory listing of the destination drive. The command string indicates that variable @1 takes on the value of whatever source drive is entered, and variable @2 takes on the value of whatever destination drive is entered.

The second command (DIR-CHKDSK) displays a directory listing of whatever drive is entered and then checks its available disk space (CHKDSK can be executed only on local drives). Since this is a new command, all variables are assigned new values (different from the variable values in the preceding COPY DIR command). Variable numbering begins again, with a new value for variable @1.

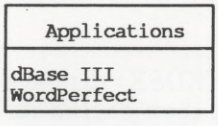
Example menu file

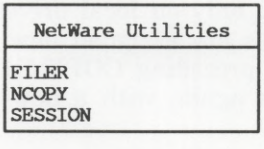
```
%Fred's Menu,5,20,0
Applications
   %Applications
NetWare Utilities
   %NetWare Utilities
Mail
   mail
Logout
   !logout
%Applications,15,10,0
WordPerfect
   wp
dBase III
   dbase
%NetWare Utilities,0,50,0
SESSION
   session
FILER
   filer
NCOPY
   ncopy @1"Enter source drive/filename"
   @2"Enter destination drive/filename"
```

This menu file will produce the following menu:



The menu will have two submenus, Applications and NetWare Utilities.





When the user selects the NCOPY option, the user is prompted to enter the source filename and the destination filename.

Use the menu

Start the menu by entering the command

MENU filename <Enter>

on the command line, or include it in the user's login script. If the menu script file is not in the current directory, you will need to specify a path. The filename extension does not need to be included if it is .MNU; otherwise you must specify the extension. MENU should be run from a directory in which the user has Create rights.

When the menu appears, you can select options on the menu by scrolling the highlight bar up and down with the up- and down-arrow keys. Press <Enter> to select a menu option. Press <Esc> to return to a previous menu or exit the menu. When you exit an application or program that was started by the menu, you will be returned to the menu that started it. If the application specified by the menu does not exist, the menu will reappear.

Task list / Quick path

Task categories are listed below. Instructions for using the task list begin on page 161.

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Using the task list / quick path

The task list is a tool for using utilities and commands at the DOS workstation and at the file server console. It contains the kind of entries you would look up in an index; the difference is that when you look up an entry in a task list, you find the instructions for completing the task you want to do rather than having to go to another section of the manual to find the information you want.

Finding the task you want

Network tasks are listed alphabetically within major categories. To find a task, look under a category first, then under the appropriate subheading.

Suppose you want to delete attributes from a file. Look up "File attribute" in the task list. The following task is listed.

Delete [FM]

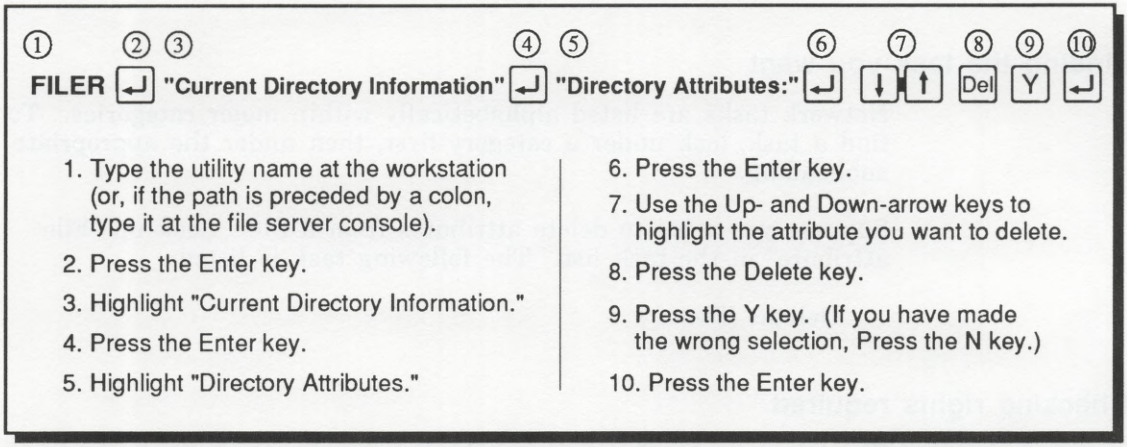
Checking rights required

The letters in brackets are an abbreviation for the trustee rights needed to delete file attributes—File scan and Modify. Letters in brackets may also represent levels of security equivalence required. "Super," for example, indicates a user must have SUPERVISOR equivalence to perform the task. The following chart explains all abbreviations found in the task list.

Trustee right or status	Description
[A]	Access Control right
[AcctMgr]	Account Manager of user involved
[C]	Create right
[ConOp]	Console Operator of file server involved
[E]	Erase right
[F]	File Scan right
[M]	Modify right
[Owner]	Owner (creator) of file, form, or print job
[QueueOp]	Print Queue Operator of queue involved
[Super]	SUPERVISOR or equivalent
[User]	User of account, password, or login script involved
[WkgrpMgr]	Workgroup Manager of user involved

Following the quick path

Once you have identified the task you want to do, follow the path and any instructions included in it. Use the diagram below to acquaint yourself with the quick path format.


① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
FILER ↵ "Current Directory Information" ↵ "Directory Attributes:" ↵ ↓ ↑ Del Y ↵
1. Type the utility name at the workstation (or, if the path is preceded by a colon, type it at the file server console).
2. Press the Enter key.
3. Highlight "Current Directory Information."
4. Press the Enter key.
5. Highlight "Directory Attributes."
6. Press the Enter key.
7. Use the Up- and Down-arrow keys to highlight the attribute you want to delete.
8. Press the Delete key.
9. Press the Y key. (If you have made the wrong selection, Press the N key.)
10. Press the Enter key.

More about the quick path

The quick path supplies only the steps necessary to complete the task. If the task involves a command line utility or a console command, you are returned to the command line or console prompt. If the task involves a menu utility, however, you have two options after completing the quick path. You can perform other tasks using the menu utility, or you can exit the utility by pressing <Alt><F10>, answering "Yes," and pressing <Enter>. (You can also exit using the Escape key.)

For more information about working with utilities, see "Utilities reference" on page 245.

Accounting

Install [Super]

SYSCON ↵ "Accounting" ↵ Y ↵

Remove [Super]

SYSCON ↵ "Accounting" ↵ "Accounting Servers" ↵ *(Mark all servers using* ↓ ↑ F5 *)* Del Y ↵ Esc Y ↵

Accounting servers

Add [Super]

SYSCON ↵ "Accounting" ↵ "Accounting Servers" ↵ Ins *(Choose server type)* ↵ ↓ ↑ (F5) ↵

Delete [Super]

SYSCON ↵ "Accounting" ↵ "Accounting Servers" ↵ ↓ ↑ (F5) Del Y ↵

List

SYSCON ↵ "Accounting" ↵ "Accounting Servers" ↵

Accounting services used, summary

Print [Super]

(Redirect ATOTAL output to a file. See below) NPRINT *filename* ↵

Accounting services used, summary (continued)

Redirect to a file [Super]

ATOTAL > *filename* ↵

View [Super]

ATOTAL ↵

Active tasks

View for a connection [Super] [ConOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ ↵ "Task Information" ↵

Addresses

Network, view user's

USERLIST *file_server_name/username* /A ↵

Network of all internet file servers, view

SLIST ↵

Network of any LAN on file server, view

FCONSOLE ↵ "LAN Driver Information" ↵ *(Select the LAN with the address you want to view)* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Node, view user's

USERLIST *file_server_name/username* /A ↵

Node of all internet file servers, view

SLIST ↵

Node of any LAN on file server, view

FCONSOLE ↵ "LAN Driver Information" ↵ *(Select the LAN with the address you want to view)* ↵

Application screen

Save to a file

CAPTURE CR=*network_directory_path\filename* AU ↵ *(Access the screen you want to print)* <Shift><PrintScrn> *(Go to DOS)*

Save several

CAPTURE CR=*network_directory_path\filename* NA ↵ *(Access each screen you want to print, pressing <Shift><PrintScrn> as you access each one)* *(Go to DOS)* ENDCAP ↵

Attributes

(See Directory attribute and File attribute)

Attach

(See Log in)

AUTOEXEC.SYS file

Create or modify [Super]

SYSCON ↵ "Supervisor Options" ↵ "Edit System AUTOEXEC File"

↵ *(Type in, edit, or delete appropriate console commands)* Esc Y ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Bindery

Repair

! *(See BINDFIX in "Utilities reference")*

Restore from backup

ꝏ NBACKUP

Cabling

Check connections

(See COMCHECK in "Utilities reference")

Network address, view

SYSCON ↵ "File Server Information" ↵ ↓↑ ↵

Charge rates

Blocks read, set [Super]

SYSCON ↵ "Accounting" ↵ "Blocks Read Charge Rates" ↵

(Choose when to charge using arrow keys) ↵ *(Set charge rates using* ↓↑ ↵ *)*

Blocks written, set [Super]

SYSCON ↵ "Accounting" ↵ "Blocks Written Charge Rates" ↵

(Choose when to charge using arrow keys) ↵ *(Set charge rates using* ↓↑ ↵ *)*

Connect time, set [Super]

SYSCON ↵ "Accounting" ↵ "Connect Time Charge Rates" ↵

(Choose when to charge using arrow keys) ↵ *(Set charge rates using* ↓↑ ↵ *)*

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Disk storage, set [Super]

SYSCON ↵ "Accounting" ↵ "Disk Storage Charge Rates" ↵

(Choose when to charge using arrow keys) ↵ *(Enter a multiplier and a divisor)* Esc

Service requests, set [Super]

SYSCON ↵ "Accounting" ↵ "Service Requests Charge Rates" ↵

(Choose when to charge using arrow keys) ↵ *(Set charge rates using* ↓↑ ↵ *)*

Color palette of network menus

Create [RFCE]

ꝏ COLORPAL ↵ Ins ↵

Delete [RFCE]

ꝏ COLORPAL ↵ ↓↑ Del Y

Modify [RFCE]

ꝏ COLORPAL ↵

Connection to file server

Clear [Super] [ConOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ Del ↵ Y

10

! = Caution! See Utilities ref. ꝏ = More information in Utilities ref. : = Do at file server console

Connection to file server (continued)

Concurrent, restrict [Super] [AcctMgr]

SYSCON ↵ "User Information" ↓↑ ↵ "Account Restrictions" ↵
"Limit Concurrent Connections" Y ↵ *(Enter number allowed)* ↵

Currently active, view [Super] [ConOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ ↵

Duration of current session, view [Super] [ConOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ ↵ "Usage Statistics" ↵

Number in use, view

SYSCON ↵ "File Server Information" ↵ ↓↑ ↵

Number supported, view

SYSCON ↵ "File Server Information" ↵ ↓↑ ↵

Physical connection, check

∞ COMCHECK

Terminate [Super]

! FCONSOLE ↵ "Connection Information" ↵ ↓↑ Del Y ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Terminate inactive automatically

: WATCHDOG ↵

Total time, view duration [Super] [ConOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ ↵ "Usage Statistics" ↵

Console operator [Super]

Assign [Super]

SYSCON ↵ "Supervisor Options" ↵ "File Server Console Operators" ↵ Ins ↓↑ (F5) ↵

Delete [Super]

SYSCON ↵ "Supervisor Options" ↵ "File Server Console Operators" ↵ ↓↑ (F5) Del Y ↵

List [Super]

SYSCON ↵ "Supervisor Options" ↵ "File Server Console Operators" ↵

Console screen

Clear

: OFF ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Device modes

View [Super]

PRINTDEF ↵ "Print Devices" ↵ "Edit Print Devices" ↵ ↓↑ ↵
"Device Modes" ↵

Directory attributes

Delete [M]

FLAGDIR . N ↵

Hidden, make visible [M]

FLAGDIR *directory_path\directory_name* N ↵

Hidden, view name

NDIR /DO ↵

Hide [M]

FLAGDIR . H ↵

Modify *(and cancel existing attributes)*

FLAGDIR . *(List attributes: N, Sy, H, or PR)* ↵

View

FLAGDIR *directory_path\directory_name* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

View possible

FLAGDIR /HELP ↵

Directory entries

Available, view

VOLINFO ↵ *(Look under "Total")*

Volume, view total

VOLINFO ↵ *(Look under "Free")*

Directory information

Creation date and time, view

(While in the directory) FILER ↵ "Current Directory Information" ↵

Name, view

NDIR /DO ↵

Rename any [M]

(Map a drive to the directory) RENDIR *driveletter: new_name* ↵

Rename default [M]

RENDIR . *(Type new name)* ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Directory structure

Hide [M]

FLAGDIR . H ↵

View

LISTDIR /S ↵

Disk channel

Information, view [Super] [ConOp]

FCONSOLE ↵ "Statistics" ↵ "Channel Statistics" ↵ ↓↑ ↵

Disk space

Limit for all new users [Super] *(Must choose in INSTALL to enable)*

SYSCON ↵ "Supervisor Options" ↵ "Default Account Balance/ Restrictions" ↵ "Limit Server Disk Space" Y ↵ *(Enter disk space limit in kilobytes)* ↵ Esc

Limit for existing users [Super] [AcctMgr] *(Must choose in INSTALL to enable)*

SYSCON ↵ "User Information" ↵ ↓↑ (F5) ↵ "Volume/Disk Restrictions" ↵ Y ↵ *(Enter space limit in kilobytes)* ↵ Esc

Limit for user [Super] [AcctMgr] *(Must choose in INSTALL to enable)*

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Limit Server Disk Space" Y ↵ *(Enter disk space in kilobytes)* ↵

View restriction for user [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Volume/Disk Restrictions" ↵

Disk status

View

ꝏ : DISK

Drive mapping

Create

MAP *drive_letter*:=*path* ↵

Create next available

MAP N *path* ↵

Create to a fake root directory

MAP ROOT *drive_letter*:=*path* ↵

10

! = Caution! See Utilities ref. ꝏ = More information in Utilities ref. : = Do at file server console

Drive mapping (continued)

Delete

MAP DEL *drive_letter*: ↵

Effective rights, view

(Change to drive) RIGHTS ↵

Information, view

SESSION ↵ "Drive Mappings" ↵ ↓↑ ↵

List

MAP ↵

Modify

(While in drive use DOS CD to change directory)

Or

SESSION ↵ "Drive Mappings" ↵ ↓↑ F3 Ins *(Choose the new path)* Esc ↵ N ↵

Search, create

MAP S16:=*drive_path*

Or

SESSION ↵ "Search Mappings" ↵ Ins ↵ Ins *(Choose the path)* Esc ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Search, delete

MAP DEL S *drive_number*:

Or

SESSION ↵ "Search Mappings" ↵ ↓↑ (F5) Del Y ↵

Search, list

MAP

Or

SESSION ↵ "Search Mappings" ↵

Search, modify

(While in search drive, use DOS CD)

Or

SESSION ↵ "Search Mappings" ↵ ↓↑ F3 Ins *(Choose the new path)* Esc ↵

Specific, view path

MAP *drive_letter*: ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Driver (LAN and Disk)

Configuration info, view

: CONFIG ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Effective rights

Any directory, view

(Map a drive to the directory) RIGHTS *drive_letter*: ↵

Default directory, view

RIGHTS ↵

Subdirectory structure, view

LISTDIR /E ↵

10

Fake root

Map a drive to

MAP ROOT *drive_letter*:=*path* ↵

OR

SESSION ↵ "Drive Mappings" ↵ Ins ↵ Ins *(Choose the path)* Esc ↵ Y ↵

File

Copy to any directory [C]

NCOPY *filename drive_letter*:*directory_path* ↵

Copy to default directory [C]

NCOPY *drive_letter*:*filename* ↵

Create from screens

(See Application screen)

Delete all from subdirectory [FE]

FILER ↵ "Directory Contents" ↵ ↓↑ Del "Delete Subdirectory's Files Only" ↵ Y ↵

Delete from directory [FE]

(Use DOS DEL filename)

Or

FILER ↵ "Directory Contents" ↵ ↓↑ (F5) Del Y ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Hide [M]

FLAG *filename* H ↵

Hold open while using

oo HOLDON ↵ *(Use HOLDOFF when finished)*

Information, view [F]

NDIR *filename* ↵

Purge salvageable for current username [FE]

PURGE ↵

Purge all [FE]

PURGE /ALL ↵

Or

: PURGE ↵

Restore after deletion [C]

oo SALVAGE ↵

10

! = Caution! See Utilities ref. oo = More information in Utilities ref. : = Do at file server console

File (continued)

View [F]

FILER ↵ "Directory Contents" ↵

File access by other users

Allow after preventing

HOLDOFF ↵

Prevent while using files

HOLDON ↵

File attribute

Assign [M]

FLAG *filename attribute_list* ↵

Delete [M]

FILER ↵ "Current Directory Information" ↵ "Directory Attributes:" ↵

↓ ↑ Del Y ↵

OR

FLAG *filename* - *attribute_list* ↵

Hidden, find name of unknown file [F]

(Change to the appropriate directory) NDIR /FO H ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Hidden, make visible [M]

FLAG *filename* -H ↵

Hidden, set [M]

FLAG *filename* H ↵

Indexed, set [M]

FLAG *filename* I ↵

Modify [M]

FLAG *filename (List attributes, separated by a single space)* ↵

Normal, set [M]

FLAG *filename* N ↵

Read Only, set [M]

FLAG *filename* RO ↵

Read Write, set [M]

FLAG *filename* RW ↵

Shareable, set [M]

FLAG *filename* S ↵

System, find name of [M]

(Change to appropriate directory) NDIR /FO SY ↵

File attribute (continued)

System, make visible [M]

FLAG *filename* -SY ↵

System, set [M]

FLAG *filename* SY ↵

Transactional, set [M]

FLAG *filename* T ↵

View for a specific file [F]

FLAG *filename* ↵

View in a directory [F]

FLAG ↵

View possible

FLAG /HELP ↵

File list

In any directory, view [F]

NDIR *drive_letter*: ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

In use by specific user, view [Super] [ConOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ ↵ "Open Files/Physical Records" ↵

File server

Attach to additional without logging out

ATTACH *file_server_name/username* ↵ *(Type the password if one is required)* ↵

Attachments, list

SYSCON ↵ "Change Current Server" ↵

Bytes written and read on, view [Super] [ConOp]

FCONSOLE ↵ "Statistics" ↵ "File System Statistics" ↵ "Read Requests" and "Write Requests"

Cache buffers, view [Super] [ConOp]

FCONSOLE ↵ "Statistics" ↵ "Cache Statistics" ↵

Default, change

(Map drive to the server and change to that drive)

Display known servers on internet

: DISPLAY SERVERS ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

File server (continued)

Down

: DOWN ↵

Or

[Super]

FCONSOLE ↵ "Down File Server" ↵ Y ↵

Hardware and driver configuration, view

: CONFIG ↵

Log out of all

LOGOUT ↵

Log out of one

LOGOUT *file_server_name* ↵

File server booting, boot disks

(See initial setup instruction in "Managing the file server")

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

File server connection

Remove

! : CLEAR STATION *workstation_number* ↵

Or

[Super]

! FCONSOLE ↵ "Connection Information" ↵ ↓ ↑ Del Y ↵

File server date/time

Set [Super]

FCONSOLE ↵ "Status" ↵ *(Enter MM/DD/YY)* ↵ *(Enter HH:MM:SS)* ↵

Synchronize workstation with file server

SYSTIME *file_server_name* ↵

View

: TIME ↵

File server error message log

Erase [Super]

SYSCON ↵ "Supervisor Options" ↵ "View file server Error Log" ↵ Esc Y ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

File server connection (continued)

View

SYSCON ↵ "Supervisor Options" ↵ "View File Server Error Log" ↵

(Scroll through messages using ↓ ↑ *)* Esc N ↵

File server name

View

: NAME ↵

File server, nondedicated

Access from workstation process at server

CONSOLE ↵

Switch into workstation mode

: DOS ↵

FLAG *(See File attribute)*

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Group

Create [Super]

SYSCON ↵ "Group Information" ↵ Ins *(Enter a new group name)* ↵

Delete [Super]

SYSCON ↵ "Group Information" ↵ ↓↑ (F5) Del Y ↵

List all

SYSCON ↵ "Group Information" ↵

Group members

Add [Super] [WkgrpMgr if created user to be added]

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Member List" ↵
Ins ↓↑ (F5) ↵

Delete [Super] [WkgrpMgr]

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Member List" ↵
↓↑ (F5) ↵

View list

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Member List" ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Group name

Assign full name [Super] [WkgrpMgr]

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Full Name" ↵ *(Enter a full name)* ↵

Modify full name [Super] [WkgrpMgr]

SYSCON ↵ "Group Information" ↵ ↓↑ F3 *(Backspace over old name; enter the new name)* ↵

Group trustee rights

Assign in directory [A]

GRANT *rights_list* FOR *directory_path* TO *group_name* ↵

Revoke in directory [A]

REVOKE *rights_list* FOR *directory_path* FROM *group_name* ↵

Revoke in subdirectories [A]

REVOKE *rights_list* FOR *directory_path* FROM *group_name* /SUB ↵

Guest

Assign password [Super]

SYSCON ↵ "User Information" ↵ *(Highlight GUEST)* ↵ "Change Password" ↵ *(Type password)* ↵ *(Confirm by typing password again)* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Delete account [Super]

SYSCON ↵ "User Information" ↵ "GUEST" Del Y ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

Hard disk

Deactivate mirroring

: UNMIRROR *drive_number* ↵

Mirror information, view [Super] [ConsOp]

FCONSOLE ↵ "Statistics" ↵ "Disk Mapping Information" ↵

Reactivate mirroring

: REMIRROR *drive_number* ↵

Repair minor problems on file server

! ∞ VREPAIR

Status and statistics, view

: DISK ↵

Hardware

Configuration info, view

: CONFIG ↵

Help

With a specific utility

∞ HELP *utility_name* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Home directory

Create automatically for new users [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Acct Bal/Restrictions" ↵ "Create Home Directory for User" Y ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

Identification number

Group, view [Super]

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Other Information" ↵

User, view [Super] [WkgrpMgr] [user]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Other Information" ↵

Internetwork

All file server names, network/node addresses, view

SLIST ↵

Information about specific file server, view

SYSCON ↵ "File Server Information" ↵ ↓↑ ↵

Intruder

Detection, activate [Super]

SYSCON ↵ "Supervisor Options" ↵ "Intruder Detection/Lockout" ↵

Y ↵ Esc

Detection, deactivate [Super]

SYSCON ↵ "Supervisor Options" ↵ "Intruder Detection/Lockout" ↵

N ↵ Esc

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Detection, set conditions for [Super]

SYSCON ↵ "Supervisor Options" ↵ "Intruder Detection/Lockout" ↵ Y ↵ "Incorrect Login Attempts" *(Type a new number)* ↵ "Bad Login Count Retention Time" ↵ *(Type new numbers)* ↵ Esc

Lock out, set conditions for [Super]

SYSCON ↵ "Supervisor Options" ↵ "Intruder Detection/Lockout" ↵ Y ↵ "Length of Account Lockout" *(Change length of lockout)* ↵ Esc

10

LAN

Board/driver type, view

FCONSOLE ↵ "LAN Driver Information" ↵ *(Select a LAN if more than one is available)* ↵

Log in

To additional file servers

ATTACH *file_server_name/username* ↵ *(Enter password if required)* ↵

To any file server

LOGIN *file_server_name/username* ↵ *(Enter password if required)* ↵

To default file server

LOGIN *username* ↵ *(Enter password if required)* ↵

Log out

Of a specific file server

LOGOUT *file_server_name* ↵

Of all attached file servers

LOGOUT ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Logical disk mappings

View for file server [Super] [ConsOp]

FCONSOLE ↵ "Statistics" ↵ "Disk Mapping Information" ↵

Logical record locks

View [Super] [ConsOp]

FCONSOLE ↵ "File/Lock Activity" ↵ "Logical Lock Information" ↵

(Type the logical record name) ↵

Logical record name

View [Super] [ConsOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ ↵ "Logical Record Locks" ↵ *(Logical record name is first field on each line)*

Login

Allow

: ENABLE LOGIN ↵

Or

[Super] [ConsOp]

FCONSOLE ↵ "Status" ↵ "Allow users to Login" Y ↵

Login (continued)

Disable

: DISABLE LOGIN ↵

Or

[Super] [ConsOp]

FCONSOLE ↵ "Status" ↵ "Allow Users to Log In" N ↵

Login information

About users, view [Super] [ConsOp] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Other Information" ↵

Login restrictions

Concurrent connections, limit [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Limit Concurrent Connections" Y ↵ "Maximum Connections" *(Enter a number)* ↵

Grace logins, limit [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Limit Grace Logins" Y ↵ *(Enter a number)* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Grace logins, remove limit [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓ ↵ "Account Restrictions" ↵ "Limit Grace Logins" N ↵

Times, set [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ (F5) ↵ "Time Restrictions" ↵ *(Use Ins to allow login, Del to prevent it)* or *(Mark a block of time using F5 ↓↑, then Ins or Del)* Esc

Times for all new users, set [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Time Restrictions" ↵ *(Use Ins to allow login, Del to prevent it)* or *(Mark a block of time using F5 ↓↑, then Ins or Del)* Esc

Workstations, restrict [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Limit Concurrent Connections" Y ↵ "Maximum Connections" *(Enter a number)* ↵

Login script

Copy one user's to a user without a script [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Login Script" ↵ *(Backspace over the username listed) (Enter the name of the user who did not have a login script, or Ins ↓↑ ↵ to select a user)* ↵ Esc Y ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

Login script (continued)

Default, override

LOGIN /S *directory_path\script_filename* ↵

Execute without logging out

LOGIN /N ↵

Prevent changes to [Super] [Acctmgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Allow User to Change Password" N ↵ *(User cannot change login script now)*

System, create [Super]

SYSCON ↵ "Supervisor Options" ↵ "System Login Script" ↵ *(Type commands appropriate for all users)* Esc Y ↵

System, modify [Super]

SYSCON ↵ "Supervisor Options" ↵ "System Login Script" ↵ *(Type additional commands appropriate for all users; delete or backspace over unwanted commands)* Esc Y ↵

User's, create [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Login Script" ↵ ↵ *(Type commands appropriate for user)* Esc Y ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

User's, modify [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Login Script" ↵

(Type additional commands appropriate for user; delete or backspace over unwanted commands) Esc Y ↵

User's, view [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Login Script" ↵

Login time

View for a user [Super] [ConsOp]

FCONSOLE ↵ "Connection Information" ↵ ↓↑ ↵ "Other Information" ↵

View for all users

USERLIST *file_server_name* ↵

Login time restriction

Set for a user [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ (F5) ↵ "Time Restrictions" ↵ *(Use* Ins *to allow login,* Del *to prevent it)* or *(Mark a block of time using* F5 ↓↑ *, then* Ins *or* Del *)* Esc

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Login time restriction (continued)

Set for all new users [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Time Restrictions" ↵

(Use Ins *to allow login,* Del *to prevent it)* or *(Mark a block of time using* F5 ↓↑ *, then* Ins *or* Del *)* Esc

LPT port

Current status, view

CAPTURE SH ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Managers *(See also "User Account Manager" and "Workgroup Manager")*

Add for user or group [Super]

SYSCON ↵ "Group Information" or "User Information" ↵ ↓↑ ↵ "Managers" ↵ Ins ↓↑ ↵

Add group to [Super]

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Managed Users and Groups" ↵ Ins ↓↑ (F5) ↵

Add user to [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Managed Users and Groups" ↵ Ins ↓↑ (F5) ↵

Delete for user or group [Super]

SYSCON ↵ "Group Information" or "User Information" ↵ ↓↑ ↵ "Managers" ↵ ↓↑ Del Y ↵

Delete group from [Super]

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Managed Users and Groups" ↵ ↓↑ (F5) Del Y ↵

Delete user from [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Managed Users and Groups" ↵ ↓↑ (F5) Del Y ↵

Managers (continued)

View for user or group [Super] [AcctMgr] [User]

SYSCON ↵ "Group Information" or "User Information" ↵ ↓↑ ↵ "Managers" ↵

View group managed

SYSCON ↵ "Group Information" ↵ ↓↑ ↵ "Managed Users and Groups" ↵

View user managed [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Managed Users and Groups" ↵

Mapping *(See Drive mapping)*

Maximum Rights Mask

Add rights to [A]

(Change to target directory) FILER ↵ "Current Directory Information" ↵ "Maximum Rights Mask" ↵ Ins ↓↑ (F5) ↵

Delete rights from [A]

(Change to target directory) FILER ↵ "Current Directory Information" ↵ "Maximum Rights Mask" ↵ ↓↑ (F5) Del Y ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

View

(Change to parent directory) LISTDIR /R ↵

Menu, customized

Access

MENU *directory_path\filename* ↵

Screen colors, modify

ꝏ COLORPAL ↵

Message

Block from console and workstations

CASTOFF ALL ↵

Clear from console

: CLEAR MESSAGE ↵

Receive again from console and workstations

CASTON ↵

Send to a group from a workstation

ꝏ SEND *message group_name* ↵

Message (continued)

Send to a user from a workstation

SEND *message username* ↵

Send to a user from the console

: BROADCAST *message connection_number* ↵

Send to all users from the console

: BROADCAST *message* ↵

Send to all workstations [Super] [ConsOp]

FCONSOLE ↵ "Broadcast Console Message" ↵ *(Type the message)* ↵ *(or* Esc *to cancel)*

Send to the console

SEND ↵ *message* CONSOLE ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

NetWare version and settings

View

NVER ↵

Or

: VER ↵

Network activity

View

: MONITOR ↵

Network board settings

View for file server

: CONFIG ↵

View for workstation

(Change to drive where IPX.COM file is located) IPX I ↵

Network packet information

Turn on console display

: TRACK ON ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Network packet information (continued)

Turn off console display

: TRACK OFF ↵

Networks

View

: DISPLAY NETWORKS

Nondedicated file server

Access from workstation

CONSOLE ↵

Switch back to workstation

: DOS ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Object type

List on any server

USERLIST *file_server_name* /O ↵

Operator

Console, create [Super]

SYSCON ↵ "Supervisor Options" ↵ "File Server Console Operators" ↵ Ins ↓↑ (F5) ↵

Print queue, create [Super]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Queue Operators" Ins ↵ ↓↑ (F5) ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Packet information on router

Display

: TRACK ON ↵

Turn off display

: TRACK OFF ↵

Password

Allow changes to [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Allow User to Change Password" Y ↵

Create/change [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Change Password" *(Type the password)* ↵ *(Re-enter the password)* ↵

Or

SETPASS *file_server_name/username* ↵ *(Type the password)* ↵ *(Re-enter the password)* ↵

Expired, limit grace logins [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Limit Grace Logins" Y ↵ "Grace Logins Allowed" *(Enter a number)* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Minimum length, change [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Minimum Password Length" *(Type the new number)* ↵

Periodic changes, require [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Force Periodic Changes" Y ↵ "Days Between Forced Changes" *(Enter a number)* ↵

Periodic changes, require for all new users [Super]

SYSCON ↵ "Supervisor Options" ↵ ↓↑ ↵ "Default Account Restrictions" ↵ "Force Periodic Changes" Y ↵ "Days Between Forced Changes" *(Enter a number)* ↵

Prevent changes to [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Allow User to Change Password" N ↵ *(User also cannot change own login script now)*

Require [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Require Password" Y ↵

Require for all new users [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Account Balance/Restrictions" ↵ "Require Password" Y ↵

Password (continued)

Require unique [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Require Unique Passwords" Y ↵

Physical disk mappings

View for file server [Super] [ConsOp]

FCONSOLE ↵ "Statistics" ↵ "Disk Mapping Information" ↵

Physical disk statistics

View for file server [Super] [ConsOp]

FCONSOLE ↵ "Statistics" ↵ "Disk Statistics" ↵ *(select a disk if required)* ↵

Print a file

Application screens

CAPTURE ↵ *(While in the application, access the screen you want to print, and press <Shift><PrintScrn>. Repeat for any other screens you want)* *(Exit the application)* ENDCAP ↵

From within an application not designed for network printing

∞ CAPTURE ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

From outside an application

ꝏ NPRINT ↵

Print device

Copy definition from one server to another [Super]

ꝏ PRINTDEF *(You must export the definition from source server's NET$PRF.DAT file to a .PDF file, then import the .PDF file into the target server's NET$PRF.DAT file.)*

Define [Super]

ꝏ PRINTDEF ↵ "Print Devices" ↵ "Edit Print Devices" ↵ Ins *(Type print device name)* ↵ *(You must now create functions then modes for the device definition.)*

Function (escape sequence), define [Super]

(Define print device first) ꝏ PRINTDEF ↵ "Print Devices" ↵ "Edit Print Devices" ↵ ↓↑ ↵ "Device Functions" ↵ Ins *(Type function name)* ↵ *(Type escape sequence shown in device documentation)* ↵ Esc ↵

Mode, define [Super]

(Define print device functions first) ꝏ PRINTDEF ↵ "Print Devices" ↵ "Edit Print Devices" ↵ ↓↑ ↵ "Device Modes" ↵ Ins *(Type the name of the mode)* ↵ Ins ↓↑ (F5) ↵ Esc

10

! = Caution! See Utilities ref. ꝏ = More information in Utilities ref. : = Do at file server console

Print device (continued)

NetWare definitions, copy [Super]

(Do from SYS:PUBLIC directory) PRINTDEF ↵ "Print Devices" ↵ "Import Print Device" ↵ ↵ ↓ ↑ ↵ Esc Esc Y ↵ "Save Data Base, then EXIT" ↵

Print form (paper)

Advance by one page

: P *printer_number* FORM FEED ↵

Define [Super]

PRINTDEF ↵ "Forms" ↵ Ins *(Type in form information. This is for reference only and doesn't affect actual line width or page length.)* Esc Y ↵

Mark top of form

: P *printer_number* MARK FORM *form_number* ↵

Modify type mounted in printer

: P *printer_number* MOUNT FORM *form_number* ↵

Print job

Delete

: Q *queue_name* DELETE JOB *job_number* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Hold [Super] [ConsOp] [QueueOp] [User]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Current Print Job Entries" ↵ ↓↑ ↵ "User Hold:" Y ↵

Interrupt and reprint pages

∞ : PRINTER *printer_number* REWIND *number_of_pages* PAGES ↵

List

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Current Print Job Entries" ↵

Or

: Q *queue_name* ↵

Modify how printed [Super] [ConsOp] [QueueOp] [User]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Current Print Job Entries" ↵ ↓↑ ↵ *(Change parameters as desired)* Esc

Modify order in queue

: Q *queue_name* CHANGE JOB *job_number* TO PRIORITY *priority_number* ↵

Rewind

∞ : PRINTER *printer_number* REWIND *number_of_pages* PAGES ↵

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Print job configuration

Choose default [Owner]

(Must have a configuration defined) PRINTCON ↵ "Select Default Print Job Configuration" ↵ ↓↑ ↵

Copy to another user [Super]

PRINTCON ↵ "Copy Print Job Configurations" ↵ *(Type name of source user)* ↵ *(Type name of target user)* ↵ Esc Y ↵

Create [Owner]

∞ PRINTCON ↵ "Edit Print Job Configurations" ↵ Ins *(Type print job configuration name)* ↵ *(Modify form items as desired)* Esc Y ↵

Delete [Owner]

PRINTCON ↵ "Edit Print Job Configurations" ↵ ↓↑ Del Y ↵

Edit [Owner]

∞ PRINTCON ↵ "Edit Print Job Configurations" ↵ ↓↑ ↵ *(Modify form items as desired)* Esc Y ↵

Rename [Owner]

PRINTCON ↵ "Edit Print Job Configurations" ↵ ↓↑ F3 *(Change name as desired)* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Print queue

Assign to a printer

: P *printer_number* ADD QUEUE *queue_name* AT PRIORITY *priority_number* ↵ *(Include line in AUTOEXEC.SYS file for automatic assignment each time server boots.)*

Assign users to [Super]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Queue Users" ↵ Ins ↓↑ (F5) ↵

Create [Super]

PCONSOLE ↵ "Print Queue Information" ↵ Ins *(Type queue name)* ↵

OR

: Q *queue_name* CREATE ↵

Delete [Super]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ (F5) Del Y ↵

Or

: Q *queue_name* DESTROY ↵

List for a printer

: P *printer_number* QUEUE

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Print queue (continued)

Map to a printer

: P *printer_number* ADD QUEUE *queue_name* AT PRIORITY *priority_number* ↵ *(Include line in AUTOEXEC.SYS file for automatic assignment each time server boots.)*

Object ID, view

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Print Queue ID" ↵

Operators, assign [Super]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Queue Operators" ↵ Ins ↓↑ (F5) ↵

Operators, remove [Super]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Queue Operators" ↵ ↓↑ (F5) Del Y ↵

Remove temporarily from a printer

: P *printer_number* DELETE QUEUE *queue_name* ↵

Remove users from [Super]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Queue Users" ↵ Ins ↓↑ (F5) ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Rename [Super]

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ F3 *(Change the queue name)* ↵

Spool printer number to

: S *printer_number* TO QUEUE *queue_name* ↵

View print jobs

: Q *queue_name* JOBS ↵

View status

PCONSOLE ↵ "Print Queue Information" ↵ ↓↑ ↵ "Current Queue Status" ↵

Printer

Advance paper by one sheet

: P *printer_number* FORM FEED ↵

Configuration, display

: P *printer_number* CONFIG ↵

Create

: P *printer_number* CREATE *port* ↵

Printer (continued)

Information, view

: P ↵

List

: P ↵

Restart

: P *printer_number* START ↵

Remove

: P *printer_number* DESTROY ↵

Stop

: P *printer_number* STOP ↵

Printing

Starting position, mark

: P *printer_number* FORM MARK ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Record of accounting transactions

Print [Super]

(Redirect to a file, then) NPRINT *filename* ↵

Redirect to a file [Super]

PAUDIT > *filename* ↵

View for entire system [Super]

PAUDIT ↵

Rights *(See User trustee rights and Group trustee rights)*

Router process

Reset

: RESET ROUTER ↵

Router Tracking Screen

Display at console, allow

: TRACK ON ↵

Display at console, prevent

: TRACK OFF ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Router Tracking Table

Reset

: RESET ROUTER ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Search drive *(See Drive mapping)*

Search mode of executable file

Set [FM]

ꝏ SMODE

View for file [F]

SMODE *directory_path\filename* ↵

View for all files in directory [F]

SMODE *directory_path* ↵

Search mode setting

Specify in SHELL.CFG

(See SHELL.CFG in "Managing workstations")

Specify for individual file [FM]

ꝏ SMODE *filename n* ↵

10

! = Caution! See Utilities ref. ꝏ = More information in Utilities ref. : = Do at file server console

Security

Evaluate for network [Super]

SECURITY ↵ *(Use DOS piping feature to save to a file: SECURITY > filename* ↵ *)*

Security equivalence

Assign [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Security Equivalences" ↵ Ins ↓↑ (F5) ↵

Delete [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Security Equivalences" ↵ ↓↑ (F5) Del Y ↵

SERVER.CFG file

Create or modify [Super]

SYSCON ↵ "Supervisor Options" ↵ "Edit System SERVER.CFG File" ↵ *(Type in, edit, or delete appropriate SERVER.CFG commands)* ↵ Esc Y ↵

Software versions

View

NVER ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Spooler mappings

Create, or modify

: SPOOL *printer_number* TO QUEUE *queue_name* ↵ *(Include in AUTOEXEC.SYS to set up automatically each time server boots. See "Managing the file server")*

List

: SPOOL ↵

Subdirectory attributes

Change [M]

FLAGDIR *subdirectory_name (List attributes you want the subdirectory to have)* ↵

Hidden, make visible [M]

FLAGDIR *subdirectory_name* N ↵

Hide [M]

FLAGDIR *subdirectory_name* H ↵

View [M]

FLAGDIR *subdirectory_name* ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

Subdirectory information

Creation date, rights information, view

NDIR /DO ↵

Owner, view

NDIR /DO ↵

Owner of one, change [Super]

FILER ↵ "Directory Contents" ↵ ↓↑ ↵ "View/Set Directory Information" ↵ "Owner:" ↵ ↓↑ ↵ *(Choose to change ownership of subdirectory or the entire subdirectory structure)* ↵

Owner of multiple, change [Super]

FILER ↵ "Directory Contents" ↵ (↓↑ F5) ↵ "Set Owner" ↵ ↓↑ ↵ *(Choose to change ownership of subdirectory or the entire subdirectory structure)* ↵

Rename [M]

RENDIR *directory_path\directory_name* TO *new_directory_name* ↵

Or

FILER ↵ "Directory Contents" ↵ ↓↑ F3 *(Change subdirectory name)* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Subdirectory structure

Create [C]

(Use DOS MD command)

Or

FILER ↵ "Directory Contents" ↵ Ins *(Type in new subdirectory name)* ↵

Delete entire [FE]

FILER ↵ "Directory Contents" ↵ ↓↑ Del "Delete Entire Subdirectory Structure" ↵ Y ↵

Delete files in [FE]

FILER ↵ "Directory Contents" ↵ ↓↑ Del "Delete Subdirectory's Files Only" ↵ Y ↵

List by pattern

oo NDIR /DO *(Type pattern including wildcard characters)* ↵

List in default directory

NDIR /DO ↵

View all levels

LISTDIR /A ↵ *(Use LISTDIR /A > filename to save to a file)*

Subdirectory structure (continued)

View one level

LISTDIR ↵ *(Use LISTDIR /A > filename to save to a file)*

SUPERVISOR

Create security-equivalent user [Super]

SYSCON ↵ "User Information" ↵ Ins *(Type in username)* ↵ *(Specify home directory creation information if required.)* ↵ "Security Equivalences" ↵ Ins *(Highlight SUPERVISOR)* ↵ Esc

Set password [Super]

SYSCON ↵ "User Information" ↵ *(Highlight SUPERVISOR)* ↵ Change Password ↵ *(Type password)* ↵ *(Confirm by typing again)* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Trustee rights *(See User trustee rights and Group trustee rights)*

Trustees, user/group

Add to directory [A]

FILER ↵ "Current Directory Information" ↵ "Trustees" ↵ Ins ↓↑ ↵ ↵ *(Modify trustee assignments if necessary using* ↓↑ Del Y ↵ *or* Ins ↓↑ ↵ *)*

Remove from all subdirectories [A]

REMOVE *user_name* FROM *directory_path* -SUB ↵

Remove from directory [A]

REMOVE *user_name* FROM *directory_path* ↵

View in any directory [A]

TLIST *directory_path* ↵

TTS

Enable

: ENABLE TRANS ↵

Or

[Super]

FCONSOLE ↵ "Status" ↵ "Transaction Tracking" *(Type "E")* Esc

TTS (continued)

Disable

: DISABLE TRANS

Or

[Super]

FCONSOLE ↵ "Status" ↵ "Transaction Tracking" *(Type "D")* Esc

Statistics, view [Super] [ConsOp]

FCONSOLE ↵ "Statistics" ↵ "Transaction Tracking Statistics" ↵

Transaction beginning point, set

oo : SETTTS *[logical_level [physical_level]]* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

UPS

View status

: UPS

Usage statistics

View [Super] [ConsOp]

FCONSOLE ↵ "Connection Information" ↵ *(Select a user)* ↵ "Usage Statistics" ↵

User

Create [Super] [WrkgrpMgr]

SYSCON ↵ "User Information" ↵ Ins *(Enter new user's name)* ↵

Create/delete multiple [Super]

(See USERDEF or MAKEUSER in "Utilities reference")

Delete [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ (F5) Del Y ↵

Remove workstation restriction [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Station Restrictions" ↵ *(Using* Del Y ↵*, remove all addresses)*

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

User (continued)

Restrict to one workstation [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Station Restrictions" ↵ Ins *(Type network address)* ↵ N ↵ *(Type node address)* ↵

View on any server

USERLIST *file_server_name* ↵

View on default server

USERLIST ↵

User account

Credit balance, give unlimited [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Balance" ↵

(Set an account balance) (Y *to allow unlimited credit)* Esc

Credit balance, limit [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Balance" ↵

(Set an account balance) N *(Set the low balance limit)* Esc

Credit balance, view [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Balance" ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Disable [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Account Disabled:" Y ↵ Esc

Enable [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Account Disabled:" N ↵ Esc

Expiration date, remove [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Account Disabled" N ↵ "Account Has Expiration Date" N ↵

Expiration date, set [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Account Has Expiration Date" Y ↵ *(Enter new expiration date)* ↵

Make permanent [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Balance" ↵ ↓ Y ↵

Make temporary [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Account Has Expiration Date" Y ↵ *(Enter new expiration date)* ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

User account (continued)

Manager, assign [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Managers" ↵ Ins ↓↑ (F5) ↵

Manager, delete [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Managers" ↵ ↓↑ (F5) Del Y ↵

Reopen [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ N Esc

Time restriction, remove [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Time Restrictions" ↵ F5 ↓↑ Ins

Time restriction, set [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Time Restrictions" ↵ F5 ↓↑ Del

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

User account credit limit

Default for all new users, set limited [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Account Balance/Restriction" ↵ "Account Balance" ↵ *(Enter a balance)* ↵ N ↵ *(Enter amount of credit)* ↵

Default for all new users, set unlimited [Super]

SYSCON ↵ "Supervisor Options" ↵ "Default Account Balance/Restriction" ↵ "Account Balance" ↵ *(Enter a balance)* ↵ Y ↵

User account manager

Assign users and groups to [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Managed Users and Groups" ↵ Ins ↓↑ (F5) ↵

Create [Super]

SYSCON ↵ "User Information" ↵ *(Highlight the manager)* ↵ "Managed Users and Groups" ↵ Ins *(Highlight the user(s) or group(s) to be managed using* ↓↑ F5 *)* ↵

Delete [Super]

SYSCON ↵ "User Information" ↵ *(Highlight the manager)* ↵ "Managed Users and Groups" ↵ *(Highlight all users and groups using* ↓↑ F5 *)* Del Y ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

User account manager (continued)

View [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Managers" ↵

User trustee rights

Assign in directory [A]

GRANT *rights_list* FOR *directory_path* TO *username* ↵

Assign same to others [Super]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Security Equivalences" ↵ Ins ↓↑ (F5) ↵

Revoke in directory [A]

REVOKE *rights_list* FOR *directory_path* FROM *username* ↵

Revoke in directory and all subdirectories [A]

REVOKE *rights_list* FOR *directory_path* FROM *username* /SUB ↵

Username

Assign full name [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Full Name" ↵

(Enter the full name) ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Modify full name [Super] [AcctMgr] [User]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Full Name" ↵

(Change name as desired) ↵

View on each attached server

WHOAMI ↵

10

! = Caution! See Utilities ref. ∞ = More information in Utilities ref. : = Do at file server console

VAPs

View information

: VAP ↵

View loaded on server or router

: VAP ↵

Volume

Directory entries allocated, view

VOLINFO ↵

Dismount (removable only)

: DISMOUNT *volume_number* ↵

Kilobytes, view

VOLINFO ↵

Maximum number supported, view

SYSCON ↵ "File Server Information" ↵ ↓↑ ↵

Mount (removable only)

: MOUNT *volume_number* ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Mount several (removable only)

: MOUNT ALL ↵

Names, view on attached servers

VOLINFO ↵ "Change Servers" ↵ ↓↑ ↵

Names, view on default server

VOLINFO ↵

Repair

(See VREPAIR in "Utilities reference")

Storage space information, view for all

CHKVOL * ↵

Storage space information, view for specific

CHKVOL *volume_name* ↵

10

! = Caution! See Utilities ref. ⚯ = More information in Utilities ref. : = Do at file server console

Workgroup manager

Assign users to [Super]

(After creating the workgroup manager) SYSCON ↵ "User Information" ↵ *(Highlight the workgroup manager)* ↵ "Managed Users and Groups" ↵ Ins ↓↑ (F5) ↵

Create [Super]

SYSCON ↵ "Supervisor Options" ↵ "Workgroup Managers" ↵ Ins ↓↑ (F5) ↵ *(Workgroup managers are managers of group EVERYONE by default)*

Delete [Super]

SYSCON ↵ "Supervisor Options" ↵ "Workgroup Managers" ↵ ↓↑ Del Y ↵ *(Note that user is still a "User account manager" for all assigned users, including group EVERYONE. Managed users and groups must be removed separately)*

Workstation

Limit number user can log in from [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Account Restrictions" ↵ "Limit Concurrent Connections" ↵ Y ↵ *(Enter number allowed)* ↵

Limit to one network address [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Station Restrictions" ↵ Ins *(Type network address)* ↵ Y ↵

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Limit to one node address [Super] [AcctMgr]

SYSCON ↵ "User Information" ↵ ↓↑ ↵ "Station Restrictions" ↵ Ins *(Type network address)* ↵ N ↵ *(Enter node address)* ↵

Workstation boot diskette and files

Create or copy

(See instructions in "Managing DOS workstations")

Workstation screen

Print contents

oo CAPTURE ↵

Workstation shell files

Update automatically [Super]

oo WSUPDATE ↵

10

! = Caution! See Utilities ref. oo = More information in Utilities ref. : = Do at file server console

Additional tasks

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Additional tasks

[ ] = Rights required to perform task. See page 161. ( ) = Instructions to a user

Utilities reference

This section tells you about the types of NetWare utilities and how to use them, and lists each utility in alphabetical order with a description and instructions for using it.

NetWare utilities overview

There are four types of NetWare utilities. Each utility description includes an icon specifying the type of the utility and how it can be used.

This icon specifies that the utility is a **command line utility**. Command line utilities are *workstation* utilities that you enter at the DOS prompt, also called the command line. These utilities execute almost immediately without leading you through menus and screens.

This icon specifies that the utility is a **console command**. Console commands are similar to command line utilities, but can be entered only at the file server console. These utilities execute almost immediately without leading you through menus and screens.

This icon specifies that the utility is a **down command**. Down commands are similar to command line utilities, but can be executed only from the command line of a downed file server. These utilities execute almost immediately without leading you through menus and screens.

This icon specifies that the utility is a **menu utility**. Menu utilities are started by entering a command on the workstation command line, but do not have command line options. Instead, the utility presents a list of options for you to choose from.

The conventions for interpreting both command line utility command formats and console commands are explained in the following chart.

KEYWORDS	Tell what the command does. Appear in uppercase; spell exactly as shown.
variables	Appear in italics. Replace with information pertinent to your task: message, filename, etc.
[option]	Brackets enclose options. Enter a command with or without the options. Don't type brackets.
[[ ]]	Nested brackets enclosed an option within an option. To include inner option, you must use outer option also.
...	Indicates more than one option can be used with the command.
< >	Indicates that you should press the key whose name appears between the angle brackets.
|	Separates either/or options. Specify one option; not both.

Wildcard characters

For all commands entered on the command line, NetWare recognizes wildcard characters as universal replacements for other characters.

* An asterisk indicates that any character or characters can occupy that position and all remaining positions in the filename. For example, to see all your default directory files with an EXE extension, type

NDIR *.EXE <Enter>

? A question mark indicates that any single character can occupy that position *only*. To see a list of all files in your default directory with a single-character extension or no extension at all, type

NDIR *.? <Enter>

Note: NetWare's use of wildcard characters is similar to DOS but differs in one respect: where DOS requires you to type *.* to represent all files in a directory, NetWare only requires one asterisk (*). See your DOS manual for additional information about using wildcard characters.

Using menu utilities

Selecting options in menu utilities.

Options are selected from the menu in one of two ways.

- Use the arrow keys to highlight the option you want. Then press <Enter>.
- Type the first letter of an option to highlight that option. If more than one option in the menu starts with the same letter(s), type enough additional letters to distinguish the option you want from the others. (For example, if both "Search" and "Select" were options, you would have to type "Sel" to highlight "Select.") Press <Enter>.

After you select an option, additional menus or displays appear on the screen. Displays include lists, entry boxes, insets, forms, and confirmation boxes, each of which is explained below.

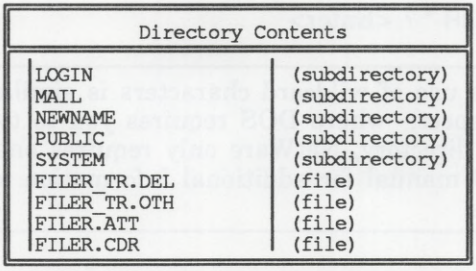
Change current server

Several menu utilities give you the option to change to another file server you have already attached to without exiting the utility. The option appears on the main menu screen of the FCONSOLE, NBACKUP, SESSION, SYSCON, and VOLINFO utilities.

If you want to use the menu utility functions with a file server other than your default server, select the "Change Server" option (or similar entry). Then you can enter the name of the file server you want to change to, or press <Ins> to select the file server from a list of those you are attached to. Press <Esc> to return to the main menu and proceed with the tasks you want to complete.

Lists

Lists are similar to a menu with options. For example, a list could look like this:

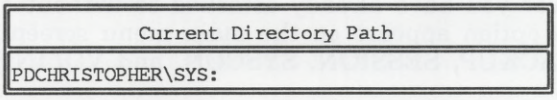


With a list, you can

- Select list items by highlighting, using the arrow keys to move the highlight bar, then pressing <Enter>.
- Select multiple items. Highlight an item, press <F5> to mark the item, highlight another item, mark it, and so forth.
- Add items to the list. Press the <Insert> key, then type in an entry or select an item from another list.
- Delete items from the list. Highlight the item to delete, then press <Del>. You may need to confirm the deletion.
- See additional items in a list (if a list has more than one column, or extends below the screen display) by pressing the Down-arrow key.
- Press <Ctrl><PageDown> to go to the bottom of the page, or <Ctrl><PageUp> to go to the top.

Entry boxes

Entry boxes allow you to type specific information, such as a username or directory.



To enter information in an entry box,

- Use the Delete, Backspace, and arrow keys to edit box information.
- Press the Insert key to display an appropriate list of items from which to choose, such as file servers, directories, or usernames. Use the Enter key to select items in a list and the Escape key to exit the list when selections are complete.

  Wildcard characters also work in some boxes; however, NetWare wildcards match anything, including a period. For example, an asterisk (*) matches with all files, including those with extensions.

Insets

Insets display information that cannot be edited. You cannot add or delete information in an inset window.

```
Volume Information

Server Name:                  PDCHRISTOPHER
Volume Name:                  SYS
Volume Type:                  fixed
Total KBytes:                 13,888
KBytes Available:              5,140
Maximum Directory Entries:     1,408
Directory Entries Available:   1,130
```

Forms

Forms contain user-modifiable fields.

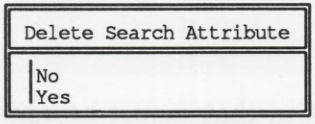
```
Filer Settings

Confirm Deletions:  No
Confirm File Copies:  No
Confirm File Overwrites:  Yes

Exclude Directory Patterns:  (see list)
Include Directory Patterns:  (see list)

Exclude File Patterns   (see list)
Include File Patterns:  (see list)

File Search Attributes:  (see list)
Directory Search Attributes: (see list)
```

With a form you can

- Move around in a form by using the arrow keys or the Enter key. (Pressing <Enter> causes the cursor to move to the next field.)
- Change a form field by highlighting the field and pressing the Enter key. Some fields allow you to type in information; others display menu items to select.

Confirmation boxes

Confirmation boxes allow you to confirm your choices.



Confirmation boxes appear whenever you

- Exit a menu utility
- Create or delete items

You can confirm or cancel the action by selecting "Yes" or "No" and pressing <Enter>.

ATOTAL

Use ATOTAL to display a daily and weekly summary of the accounting services your network is using.

ATOTAL compiles information from the system accounting records and lists

- Total blocks read and written;
- Total connect time in minutes;
- Total service requests;
- Total disk storage in blocks per day.

These figures can help you estimate how much each service is being used and how much to charge for the service.

Command format

ATOTAL

Using ATOTAL

- ATOTAL is placed in SYS:SYSTEM during installation.
- Accounting must be installed on the file server.
- Use DOS redirection (>) to save the listing to a file.

Related commands

SYSCON (Accounting)

ATTACH

Use ATTACH to connect your workstation to additional file servers on your network or internetwork.

Command format

ATTACH [server[/user]]

Using ATTACH

- ATTACH is placed in SYS:LOGIN and SYS:PUBLIC during installation.
- Log in to a file server so that you have a search mapping to SYS:PUBLIC before attaching to others.
- If you do not include the file server name and username in the command, enter them individually at the prompts. If the username requires a password, enter it at the prompt.
- Use MAP to map a network drive to the directory you want to access on the file server you have attached to.
- To attach to another file server every time you log in, include ATTACH in your user login script.
- If you want to map a network drive permanently to a directory on the other file server, place the drive mapping in your login script as well.

Related commands

LOGIN
MAP
WHOAMI

BINDFIX

Use BINDFIX to correct the following problems with the NetWare bindery:

- A username cannot be deleted or modified.
- A user's password cannot be changed.
- A user's rights cannot be modified.
- The error "unknown server" occurs during printing even though you are printing on the default server.
- Error messages referring to the bindery are displayed at the file server console.

Command format

BINDFIX

Using BINDFIX

- BINDFIX is placed in SYS:SYSTEM during installation.
- Log in as SUPERVISOR or as a user with SUPERVISOR equivalence.
- Make sure all users are logged out (use BROADCAST and MONITOR or FCONSOLE along with DISABLE LOGIN).

What BINDFIX does

BINDFIX shuts down the bindery files so users cannot access them, and then rebuilds and reopens the bindery files. While it rebuilds the files, BINDFIX lists the tasks it is performing.

If you answer "Yes" to deleting the mail subdirectories, all mail subdirectories of users who no longer exist on the network are deleted. If you answer "Yes" to deleting trustee rights for users who no longer exist on the network, BINDFIX scans all mounted volumes and removes users who no longer exist on the network from all the trustee lists.

BINDFIX creates new NET$BIND.SYS and NET$BVAL.SYS, renaming the previous versions of these files NET$BIND.OLD and NET$BVAL.OLD. When BINDFIX is finished, a message states whether the bindery check was successful or not.

After the bindery check

If the bindery check was successful, check the reconstructed bindery to verify that any problems you were having have been corrected. If they have been, you should delete the .OLD bindery files from SYS:SYSTEM.

If the bindery check was not successful, (the reconstructed bindery does not solve the problem with your file server, or the power failed while BINDFIX was running), run BINDREST to restore the .OLD bindery files and return the bindery to its original state.

Related commands

BINDREST
BROADCAST
CLEAR STATION
DISABLE LOGIN
FCONSOLE (Connection Information)
MONITOR

BINDREST

Use BINDREST to restore a previous version of the bindery files if BINDFIX fails.

Command format

BINDREST

Using BINDREST

- BINDREST is placed in SYS:SYSTEM during installation.
- Log in as SUPERVISOR or as a user with SUPERVISOR equivalence.
- Make sure all users are logged out (use BROADCAST and MONITOR or FCONSOLE along with DISABLE LOGIN).

What BINDREST does

BINDREST cancels the effects of BINDFIX by restoring the backup bindery files created by BINDFIX, NET$BIND.OLD and NET$BVAL.OLD, to their original version and names, NET$BIND.SYS and NET$BVAL.SYS.

Related commands

BINDFIX
BROADCAST
CLEAR STATION
DISABLE LOGIN
FCONSOLE (Connection Information)
MONITOR

BROADCAST

Use BROADCAST at the file server console to send a message to users logged in or attached to the file server.

Command format

BROADCAST "message" [connection number] [[and|,|] [connection number]

Using BROADCAST

- BROADCAST is coded into the file server operating system.
- Type your message and the connection number. When you send a message to multiple workstations, separate the connection numbers with "and," a comma, or a space. Quotation marks must enclose messages for specific workstations but not messages for all workstations.
- Workstations clear the message by pressing <Ctrl><Enter>.
- Workstations listing the file server with WHOAMI will receive that file server's BROADCAST messages, but those attached to only that file server's LOGIN directory will not receive them. Workstations using CASTOFF ALL will not receive BROADCAST messages until after using CASTON.

When a workstation receives a message, the workstation is prevented from executing any further commands until the message is cleared with <Ctrl><Enter>. Before starting a process that can run unattended on a workstation, you should use CASTOFF A to prevent program interruption. Use CASTON to receive messages sent while CASTOFF was active and to begin receiving messages again.

- Remote workstations and workstations using ACS, NACS, or some graphics applications do not receive BROADCAST messages. Users with such graphics may hear a beep and must still press <Ctrl><Enter> though they see no message. Texas Instruments workstations do not receive or display messages until you press a key (usually <Enter>). Press <Esc> to erase the message.

Related commands

CASTOFF
CASTON
SEND
SESSION (User List)

CAPTURE

Use CAPTURE to intercept print jobs sent to a parallel port on the workstation and redirect them to a print queue on a file server. CAPTURE forms a logical link between the printer ports on a workstation and a print queue or file.

The main purpose of CAPTURE is to allow you to print to a network printer even though the application does not support network print queues. The application thinks that it is printing to a regular printing port, but the output is redirected to a network print queue or to a print file.

After setting up a logical link using CAPTURE, you can print as though the network printer were physically connected to your workstation. You can then perform such tasks as

- Print screen displays using <Shift><Print Screen> or <Print Screen>;
- Saving data to a network file by using the **CR**eate= option;
- Printing to a network printer from an application that cannot print to network print queues.

Command format

CAPTURE [option...]

Using CAPTURE

If you print only from applications that have the ability to print to a network print queue, you will probably not need to use CAPTURE.

Before entering an application that cannot print to a network queue, enter CAPTURE at the DOS prompt with options.

To use CAPTURE every time you log in, put the CAPTURE command in your login script with options.

If you don't use CAPTURE. If none of your LPT ports are captured and you press <Shift><Print Screen>, your workstation could hang. You can prevent this by including the following in the SHELL.CFG file on your workstation boot diskette:

```
LOCAL PRINTERS = 0
```

Command options. Use command options to specify how, where, and when your jobs will be printed. You can include multiple command options by separating them with a space.

Print job configurations. Rather than specifying numerous options each time you enter the CAPTURE command, you can set up a print job configuration using PRINTCON. You can then specify which configuration you want CAPTURE to use by entering the CAPTURE command with the JOB option. See the list of options below.

If you don't enter any configuration options, CAPTURE will use the configuration specified by the default. See PRINTCON for more information on print job configurations.

Ending CAPTURE. Data traveling to a network print queue as a print job doesn't usually arrive at the print queue in one message packet. CAPTURE must tell the file server when the print job is ready to be sent from the queue to the printer. You can specify the method by using one of these three options:

Type of ending	CAPTURE option	What you do	What happens
Automatic	**A**Utoendcap	Exit an application.	A print job is sent to the print queue and a new capture session begins.
Timed	**TI**meout	Specify a number of seconds.	A print job is sent to the print queue and a new capture session begins.
Manual	**No**Autoendcap	Type ENDCAP.	A print job is sent to the print queue and the capture of the port ends.

Set up CAPTURE automatically. Instead of entering the CAPTURE command manually before starting your application, you may want to enter the command in your login script so that it is executed each time you log in. See "Logging in and out" for information on the login script.

The chart on the next two pages explains the options available with the CAPTURE command.

Option	Function	Variable	Default
AUtoendcap	Instruct the print server to send the print job from print queue to printer or file upon entering or exiting an application. Does not end capture as name implies.	n/a	Enabled.
Banner= banner	Specify the word to appear on the lower half of your banner page.	One word or phrase up to 12 characters long. Use the underline to represent a space between words.	LST:
Copies=n	Indicate the number of copies to be printed.	The number of copies from 1 to 999.	1
CReate= filespec	Send data to file rather than a printer. File will be created in your default directory unless you specify a directory path. Can only be used with A, NA, TI=, L=.	Any valid filename.	n/a
Form=n	Specify the number of the form print job will be printed on. If the printer is correctly mounted with a different form, the file server will prompt for a change of form before the job will be printed.	The number of a form defined by SUPERVISOR using PRINTDEF.	The form name specified in your default print job configuration (if one exists).
FormFeed	Enable form feed after your print job has been printed.	n/a	Enabled.
Job=job	Specify print job configuration to be used. (Print job configurations are created using PRINTCON.)	The name or number of a print job configuration.	Your default print job, if one exists. If not, CAPTURE uses defaults of other options.
Keep	Ensure that all data captured in the queue will be retained if your workstation hangs while you are capturing data. Fifteen minutes after your workstation hangs, the print server sends the uncompleted print job to the printer.	n/a	The print server discards the unfinished print job.
Local=n	Indicate which LPT port to capture (1, 2, or 3).	1, 2, 3, indicating LPT1, LPT2, or LPT3	1
NAMe=name	Specify the username you want to appear on the upper half of your banner page.	Any valid username.	The username you used to log in.

Option	Function	Variable	Default
No Autoendcap	Prevent sending print jobs from print queue to printer or file upon entering or exiting an application. Can prevent premature closing of a file you are creating.	n/a	Autoendcap enabled.
No Banner	Specify that a banner page not be printed.	n/a	A banner page will be printed.
NoFormFeed	Disable form feed at the printer.	n/a	Form feed enabled.
NoTabs	Ensure that all tab characters in your print job arrive at the printer unchanged. Do not include this option if your application has a print formatter. (Most applications do.)	n/a	n/a
Queue= queue	Indicate which queue the print job will be sent to.	The name of a queue on the default server or another server specified with the **S** option.	The queue to which SPOOL 0 is mapped.
SHow	View capture status of LPT ports. Do not use with any other option.	n/a	n/a
Server= server	Indicate file server where print jobs will be sent. If you are not currently attached, CAPTUREwill attach as user GUEST.	The name of the file server.	Your default server.
Tabs=n	Replace all tab characters in your print job with the number of spaces you specify. Do not include this option if your application has a print formatter. (Most applications do.)	The number of spaces from 0 to 18.	8
TImeout=n	Enable timeout feature. File server will send print job from print queue to printer if no more data is added to the job in the queue.	Any number from 1 to 1,000, indicating the number of seconds before the current capture times out.	0

CASTOFF

Use CASTOFF to block messages sent from other network stations.

Command format

CASTOFF [A[LL]]

Using CASTOFF

- CASTOFF is placed in SYS:PUBLIC during installation.
- To block messages from the file server console as well, include "A" or "ALL" in the CASTOFF command.

What CASTOFF does

When a network station receives a message, other processing stops until you clear the message. The only way to prevent this interruption is to run CASTOFF.

If you want to start a process (such as compiling, recalculating, or remote hookup) that can run unattended on a workstation, use CASTOFF to prevent other stations from interrupting the process. Use CASTON to allow message reception again.

Messages sent to the workstation are saved, so that when you enter CASTON they will all be displayed.

Related commands

BROADCAST
CASTON
SEND
SESSION (User List)

CASTON

Use CASTON to allow your workstation to receive messages from other network stations after you have used CASTOFF.

Command format

CASTON

Using CASTON

- CASTON is placed in SYS:PUBLIC during installation.
- Press <Ctrl><Enter> to clear a message that appears on your workstation screen. Your workstation cannot process information until you clear the screen.

Related commands

BROADCAST
CASTOFF
SEND
SESSION (User List)

CHKVOL

Use CHKVOL to view how much space is being used and how much space is available on a volume. You can view information for all volumes on all file servers to which you are attached.

Command format

CHKVOL [path]

Using CHKVOL

- CHKVOL is placed in SYS:PUBLIC during installation.
- To view information on any attached server other than your default, include the name of the file server in the path.

Example

If user SANDY on file server FOUR enters CHKVOL, information similar to the following appears:

```
Statistics for fixed volume FOUR/SYS:

Total volume space:                153,501,696  K Bytes
Space used by 23,581 files:        102,195,200  K Bytes
Space remaining on volume:          51,306,496  K Bytes
Space available to SANDY:           51,306,496  K Bytes
Directory entries available:            20,199  K Bytes
```

Note: "Directory entries available" does not refer to the number of directories you can still reasonably create on the volume. Each directory, DOS file, subdirectory, and trustee list uses one directory entry. Macintosh files use two directory entries.

Related commands

ATTACH
VOLINFO

CLEAR MESSAGE

Use CLEAR MESSAGE to clear messages from the message display area at the bottom of the file server console screen when using MONITOR.

Command format

CLEAR MESSAGE

Using CLEAR MESSAGE

- CLEAR MESSAGE is coded into the file server operating system.
- CLEAR MESSAGE clears the message area without clearing the entire screen and without affecting MONITOR.

Related commands

BROADCAST
SEND

CLEAR STATION

Use CLEAR STATION to remove all file server resources from the workstation you specify.

Use this command with caution! CLEAR STATION is usually used only when a workstation crashes, leaving open files on the file server. If a workstation is in the middle of a transaction or a file update when it is cleared, the files may be closed with incorrect data.

Command format

CLEAR STATION n

Using CLEAR STATION

- CLEAR STATION is coded into the file server operating system.
- Replace *n* with the workstation number you want to clear. If you are unsure of the number, use MONITOR or FCONSOLE to locate it.
- When you use CLEAR STATION, the file server closes all of the workstation's open files. The communication link between the file server and workstation is broken completely and all drive mappings to the file server disappear.
- If drive mappings to other file servers existed before the station was cleared, the user can continue working on those network drives. The user can use DOS CD to change a drive mapping to SYS:PUBLIC on one of the other servers to access NetWare utilities and modify mappings, etc.
- If the crashed workstation had no drive mappings to other file servers, users must reboot the workstation and reload the workstation shell before accessing any network resources.

Related commands

FCONSOLE (Connection Information)

COLORPAL

Use COLORPAL to customize the color scheme of NetWare menu utilities and menus created with MENU. You can also use COLORPAL to correct problems with monochrome monitors attached to composite adapters.

COLORPAL's main color table is located in the file IBM$RUN.OVL in the SYS:PUBLIC directory. Changes are stored in this file. Since this file resides in a public directory, changes to it affect all color monitors on the network (unless the short machine type in the SHELL.CFG file for one or more computers is something other than IBM).

The default color palettes (0-4) are used by NetWare menu utilities. These default color palettes can be modified as explained on page 270. However, we do not recommend modification of the overlay files in SYS:PUBLIC. Changes made to these files may cause menus to become unreadable.

Only the system supervisor should make changes to the IBM$RUN.OVL file in the SYS:PUBLIC directory.

Command format

COLORPAL

Using COLORPAL

COLORPAL modifies the overlay file (IBM$RUN.OVL) that controls color combinations in NetWare menus. (See **Color Palettes** in *Concepts*.) To run COLORPAL you must have [RFCE] rights.

Run COLORPAL

1. Enter COLORPAL. The "Defined Palettes" menu is displayed, listing palettes 0 through 4 and any other palettes you have defined.

2. Select the palette to change. (You must have Read, File Scan, Create, and Erase rights to modify this file.) The "Edit Attribute" and "Current Palette" windows appear.

   If you are creating a new color palette, press <Insert> and then select the new color palette.

3. To change an attribute, select it from the "Edit Attribute" window.

   For example, to change the background of your current palette from blue to black, select the "Background Reverse" attribute in the "Edit Attribute" window. The "Select Color" list appears.

   Whenever you choose an attribute in the "Edit Attribute" window, you see the "Select Color" list. This list varies according to whether you are editing the foreground or the background.

   When the "Select Color" window appears, the color currently being used by the specified attribute is highlighted.

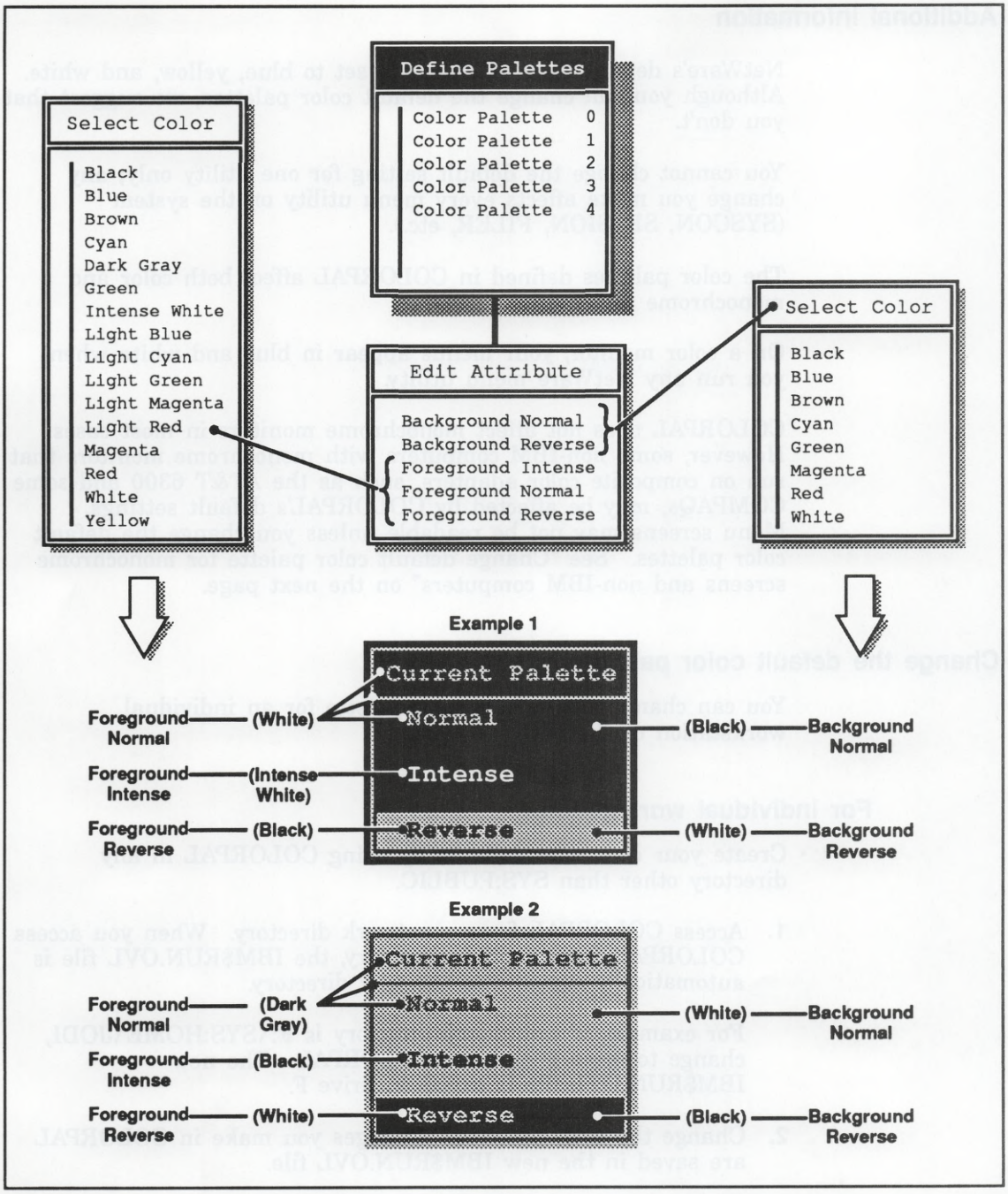
4. To change the color, select the new color. The "Current Palette" window reflects any color changes you make.

   You can repeat this procedure to change as many color attributes in the default palettes as you want.

5. To exit the program, press <Esc> and verify your changes. If you do not have [RFCE] rights in the directory, you will not be able to save changes.

An overview of COLORPAL

The figure on the next page illustrates the "Define Palettes" menu and the submenus that are accessible for each palette. You can modify using the <Enter> key, add using the <Insert> key, or delete using the <Delete> key, a color palette using the initial menu. For each palette, choose colors for two background and three foreground colors. The Current Palette menu shows the combination of colors chosen.



COLORPAL Overview

Additional Information

NetWare's default color palettes are set to blue, yellow, and white. Although you can change the default color palettes, we suggest that you don't.

You cannot change the default setting for one utility only; any change you make affects every menu utility on the system (SYSCON, SESSION, FILER, etc.).

The color palettes defined in COLORPAL affect both color and monochrome monitors.

On a color monitor, your menus appear in blue and white when you run any NetWare menu utility.

COLORPAL does not affect monochrome monitors in most cases. However, some non-IBM computers with monochrome monitors that run on composite color adapters, such as the AT&T 6300 and some COMPAQs, may be affected by COLORPAL's default settings. Menu screens may not be readable unless you change the default color palettes. See "Change default color palette for monochrome screens and non-IBM computers" on the next page.

Change the default color palette

You can change the default color palette for an individual workstation or the entire system.

For individual workstations

Create your own color defaults by using COLORPAL in any directory other than SYS:PUBLIC.

1. Access COLORPAL from a network directory. When you access COLORPAL from another directory, the IBM$RUN.OVL file is automatically copied into the new directory.

   For example, if your home directory is F:\SYS:HOME\JODI, change to drive F and run COLORPAL. The new IBM$RUN.OVL file is saved on drive F.

2. Change the color palettes. Changes you make in COLORPAL are saved in the new IBM$RUN.OVL file.

3. Map your first search drive to the directory containing the new IBM$RUN.OVL file. (The file is a hidden file and will not appear in directory searches.)

For example, map your first search drive to your home directory by typing

```
MAP INS SEARCH1:=FILE_SERVER_NAME/SYS:
    HOME/JODI  <Enter>
```

4. Run the menu utilities from any drive.

   Whenever you run a menu utility, the system looks for the IBM$RUN.OVL file in your first search drive. However, if your first search drive is mapped to SYS:PUBLIC, the system defaults are used instead of the defaults you set.

For entire system

To change the default color palettes for the entire system, first ensure that the IBM$RUN.OVL or CMPQ$RUN.OVL file in the SYS:PUBLIC directory is flagged Normal. (You must have Read, File Scan, Create, and Erase rights to modify this file.)

Then run COLORPAL in the SYS:PUBLIC directory.

Create new color palettes

You can create additional color palettes with COLORPAL to use only with menus you create, not with the NetWare menu utilities.

To use these color palettes with the menus you create with the MENU program, see the MENU utility section in this manual.

Run COLORPAL in any directory that you have a search drive mapped to.

Change the default color palettes for monochrome screens and non-IBM computers

NetWare's default color palettes, which are set to blue and white, affect all NetWare menu utilities run on monitors connected to color adapters. The default color palettes work with color monitors.

When a monochrome monitor is connected to a composite color adapter, the default foreground and background colors appear with the same intensity, and the monitor display is unreadable. This problem generally occurs on COMPAQ and AT&T 6300 computers.

NetWare v2.1 and above includes a file called CMPQ$RUN.OVL, which contains black and white default color palettes. Use these

defaults for computers that have problems using the blue and white defaults.

If you have a computer that runs a monochrome monitor from a composite color adapter and menu screen displays appear on your screen with little or no contrast, you can solve the problem by completing any one of the following steps:

- Change the short machine type specified in the boot diskette's SHELL.CFG file to CMPQ.
- Change the prefix of the CMPQ$RUN.OVL file to match the short machine type (such as AT&T).
- Change the default color palettes to black and white using COLORPAL.

Change the short machine type in the SHELL.CFG file

If you change a workstation's short machine type (in a SHELL.CFG file on the boot diskette) from "IBM" to "CMPQ," the computer then accesses the CMPQ$RUN.OVL file (with the black and white color palette defaults) when you run NetWare menu utilities.

If you do not have a SHELL.CFG file on your boot diskette, you can create one by following the instructions found in "Managing DOS workstations" on page 29.

To change the short machine type, complete the following steps.

1. Bring up the SHELL.CFG file with a text editor.
2. Erase the existing short machine type (if it is not CMPQ) and type "CMPQ" in its place.

   If there is no short machine type specified, insert the following line anywhere in the SHELL.CFG file.

   ```
   SHORT MACHINE TYPE = CMPQ
   ```

COMCHECK

Use COMCHECK to test the communications between network stations. This utility does not require that the network be running; it is intended to be used to check cabling and communication between network workstations, servers, and routers before the network is up and running.

Command format

COMCHECK

Using COMCHECK

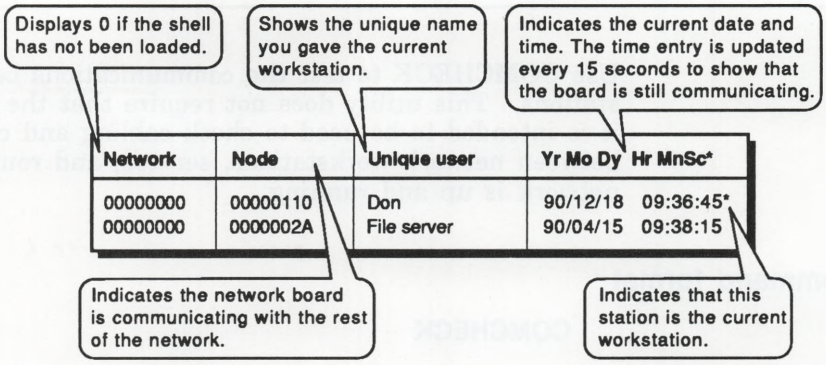
- COMCHECK is on the *WSGEN* diskette.
- COMCHECK checks the physical connections between network stations, as may be necessary in certain troubleshooting situations.

How to run COMCHECK

1. Cable at least two network stations, then load DOS and IPX.COM at each one.
2. Insert the *WSGEN* diskette in each station's local drive and type

   COMCHECK <Enter>

   COMCHECK will then prompt you to enter a unique name to identify the station. Information similar to the following appears:


Displays 0 if the shell has not been loaded.
Shows the unique name you gave the current workstation.
Indicates the current date and time. The time entry is updated every 15 seconds to show that the board is still communicating.
Network
Node
Unique user
Yr Mo Dy Hr MnSc*
00000000 00000110 Don 90/12/18 09:36:45*
00000000 0000002A File server 90/04/15 09:38:15
Indicates the network board is communicating with the rest of the network.
Indicates that this station is the current workstation.

If the station does not display such information after 15 seconds, check the cabling between the stations and make sure the LAN boards are properly inserted. If a LAN board has a duplicate or illegal station (node) address, see the appropriate installation supplement for proper adjustment.

3. Change time parameters or exit COMCHECK by pressing <Esc> and selecting an option. The Broadcast Delay period is the number of seconds between updates (broadcasts) from a particular station. The default is 15 seconds.

   The Dead Timeout Period is the number of seconds after which a station will be considered "dead" if it does not broadcast an update transmission. The default is 60 seconds. The setting must be at least 10 seconds greater than the broadcast delay period. The information for any station considered dead is shown in bold on the screens of all other stations running COMCHECK.

COMPSURF

Use COMPSURF to test and format older, questionable hard disks for NetWare. Use COMPSURF only on hard disks attached to a Host Bus Adaptor (HBA). Never run COMPSURF on NetWare-ready drives; this would erase any NetWare-ready information on the disk.

New hard disks do not require testing with COMPSURF. INSTALL prepares new hard disks using the track zero test (Z-test) rather than COMPSURF.

Running COMPSURF destroys all data contained on a hard disk. Use it to reformat disks only as an extreme measure to correct major disk problems when it has become impossible to read data from and write data to the disk.

Command format

COMPSURF

Using COMPSURF

It can take several hours to test each hard disk properly and thoroughly with COMPSURF. Be sure to allow sufficient time.

You must install hard disks before you run COMPSURF. You must also run DISKSET (or an equivalent third-party utility) if you have HBAs connected to disk subsystems.

You should also locate the "External Hard Disk" worksheet in *Installing and Maintaining the Network*. During COMPSURF you will need to refer to the information on this worksheet.

Preparing to run COMPSURF

1. Back up the existing disk files. Before reformatting a problem disk, try to copy as many data files as possible to a disk that is operating properly.

2. Bring down the file server. Tell all users to close their data and application files and log out. Then bring down the file server by using the DOWN command at the file server console.

If you do not bring down the file server in this way, you may lose valuable data.

3. Locate the disk manufacturer's test printout. Many hard disks are shipped with a manufacturer's bad block list that identifies by head number and cylinder number any bad blocks found by the manufacturer prior to shipment.

   If the hard disk you will be formatting or reformatting with COMPSURF has a manufacturer's bad block list, you may want to enter the bad blocks from the list before COMPSURF actually begins testing. You are prompted to enter these blocks after you access the COMPSURF utility.

   The manufacturer's bad block list is usually printed on a sticker attached to the hard disk housing. Often the list will be duplicated on a printout supplied with the disk. If you do not have a printout of the bad block list, you may have to remove the cover from the file server or disk subsystem to locate the bad block list sticker on the disk itself.

4. Prepare a parallel printer. If you want to print the list of bad blocks COMPSURF finds, you must have a parallel printer connected to the first parallel port (LPT1) on the file server.

COMPSURF will run without a parallel printer; however, if you run COMPSURF without a printer, you must be careful not to select any option that indicates printing the test results. If you select an option that indicates printing when no printer is attached to the file server, COMPSURF may hang.

5. Check the disk configuration information. Make sure you have identified all network hard disks in your hardware configuration, including disks both in the file server and in disk subsystems.

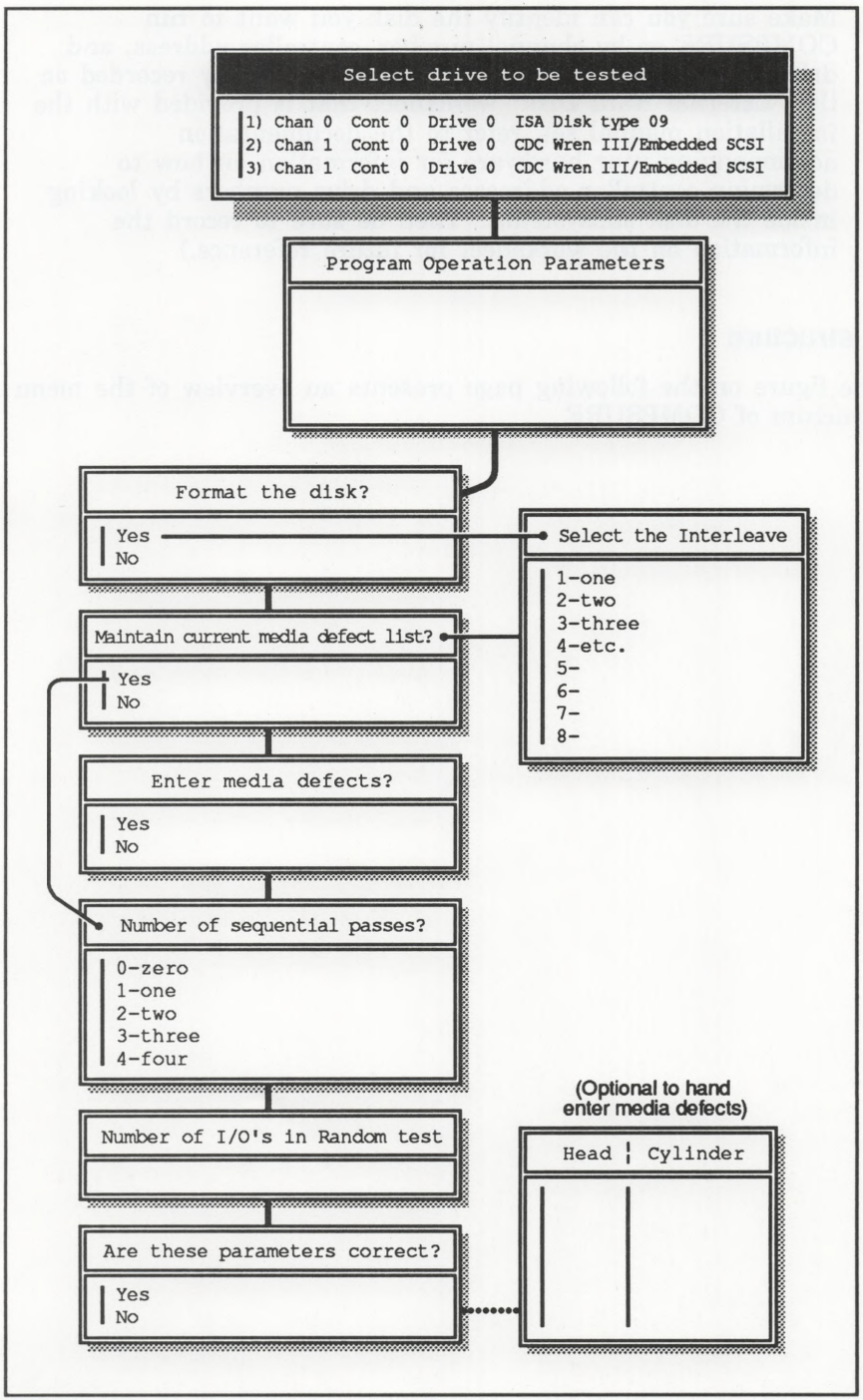
   Run DISKSET to identify hard disks in disk subsystems and inside the file server.

   Run SETUP (or similar) utility supplied by the computer manufacturer to identify internal disk drives in other types of file servers.

Make sure you can identify the disk you want to run COMPSURF on by channel number, controller address, and drive number. (If this information is not already recorded on the "External Hard Disk" worksheet that is provided with the installation manual set, refer to the documentation accompanying your hardware for information on how to determine controller addresses and drive numbers by looking inside the disk subsystems. Then be sure to record the information on the worksheet for future reference.)

COMPSURF menu structure

The figure on the following page presents an overview of the menu structure of COMPSURF.



COMPSURF Overview

You can format and test only one hard disk at a time. Run COMPSURF on each disk to be formatted and tested.

Starting COMPSURF

COMPSURF is found in the SYSTEM-2 directory. Map a drive to the SYSTEM-2 directory or insert the *SYSTEM-2* diskette in drive A.

At the downed file server, boot DOS and at the DOS prompt type

```
COMPSURF <Enter>
```

Selecting the disk drive to be tested

The "Comprehensive Surface Analysis" header appears on the screen along with a list of the hard disk drives attached to the file server. Select the hard disk you want to test.

Note: Do not be concerned if the head, cylinder, and sectors-per-track values displayed in the header do not reflect the actual values for the disk. Certain types of disk drives do not supply this information; COMPSURF uses default values for any such disks.

Selecting the program operation parameters

At this point you must specify the appropriate COMPSURF operation parameters for the hard disk you have selected. All of the possible parameters are listed below; however, you may not be prompted for all of them.

The parameters that appear depend on the type of disk you are testing and whether or not it has been previously formatted with COMPSURF.

1. **Specify whether or not to format the disk.** The first prompt appears only when you are retesting a disk that has previously been formatted with COMPSURF; any hard disk that has never been tested with COMPSURF will automatically be formatted.

   If you answered "Yes" to the "Format disk?" prompt and if the hard disk you have selected requires an interleave value, select the interleave value (see **Interleave** in *Concepts*).

For greatest efficiency, select the interleave value according to the type of disk you are formatting:

- For internal hard disks in all NetWare file servers and in IBM PC AT-type file servers that run off IBM or Western Digital controllers, use the default interleave value of 2.
- For internal hard disks in an IBM PS/2 file server, select an interleave value of 1.
- For other types of hard disks (embedded SCSI or third-party external disks), check with the disk supplier to determine the appropriate interleave value.

2. **Specify whether or not to keep the current bad block list.** Each hard disk drive maintains a list of disk areas that are physically unable to hold data reliably. This list is referred to as the "media defect list," or "bad block table."

   - Answer "Yes" if you want COMPSURF to keep the current list of bad blocks or to rebuild a new bad block table. If you answered "Yes," you will not see the prompt in the next step.
   - Answer "No" and the media defect list is cleared. If you answered "No" to the previous prompt, you are asked if you want to enter media defects.

3. **Specify if you want to enter the media defect list.** The media defect list is also know as the bad block list.

   - If the disk you are testing was not shipped with a manufacturer's media defect list, answer "No" to the prompt and go on to the next section.
   - If the disk was shipped with a manufacturer's media defect list, you can enter the bad block list from the file server keyboard. The bad blocks you enter from this list, plus any additional bad blocks found by the COMPSURF utility, will be written to the disk's bad block table.

   We recommend that you enter the manufacturer's bad block list, if possible, to ensure that these blocks are included in the NetWare-compatible bad block table on the disk.

   You will be prompted to enter the manufacturer's bad block list after you have finished specifying the remaining program operation parameters.

4. **Select the number of passes for the sequential test.**
   COMPSURF's Sequential Test writes patterns to the disk sequentially to analyze the disk's surface. Any bad blocks that are found are added to the disk's bad block table so that the file server will not attempt to store data in them.

   Each pass of the Sequential Test takes approximately 30 to 45 minutes for a 20MB hard disk. The test takes longer for hard disks with larger storage capacity.

   You can specify that the Sequential Test be performed from one to five times (or not at all). However, the COMPSURF criteria used to determine the reliability of the disk are based on three passes of the Sequential Test. For best results, perform the Sequential Test three times.

5. **Select the number of reads and writes in the random test.**
   COMPSURF's Random Test writes data patterns to random locations on the disk to locate bad blocks. Any bad blocks that are found are included in the disk's bad block table so that the file server will not attempt to store data in them.

   The default number of writes (I/Os) shown in the prompt is the recommended minimum number of random I/Os to ensure an adequate test of the disk's head-positioning mechanism. It takes approximately three minutes for the Random Test to do 1,000 I/Os. For example, a Random Test on a 20MB hard disk requiring 16,000 random I/Os would take 45 to 50 minutes.

   We recommend you accept the default number of I/Os for the Random test. However, you may specify a different number of I/Os at the prompt.

6. **Confirm the operation parameters you have selected.**

Entering the bad block list

If the "Program Operation Parameters" window shows that "Media defects will be hand entered," you must now enter the manufacturer's bad block list from the file server keyboard.

An empty bad block window appears on the screen.

Bad blocks are identified by head and cylinder number. Each hard disk has a certain number of read/write heads and a specific number of cylinders. The number of heads and cylinders for the currently selected disk should be displayed on the second line of the COMPSURF screen header.

As indicated on the screen, you press <Insert> to add a block to the table and <Delete> to delete a block from the table.

Adding a bad block to the list

To add a bad block to the bad block list, complete the following steps:

1. Press <Insert>. A screen like this appears:

   ```
   Enter head number (zero relative)
   ```

2. Type the head number of one of the bad blocks on the manufacturer's bad block list. (Heads are usually numbered starting with zero, or "zero relative." In other words, if your disk has seven heads, they are numbered from zero to six.)

3. After you have typed the head number, press <Enter>. A prompt like this appears:

   ```
   Enter cylinder (zero relative)
   ```

4. Type the cylinder number of the bad block as it appears in the manufacturer's list. (As with heads, cylinders are also numbered starting with zero, or "zero relative.")

5. After you have typed the cylinder number, press <Enter>. The head and cylinder numbers are displayed in the list on the screen.

   If you make a mistake and type an incorrect head or cylinder number, you can delete it. To delete a bad block from the bad block list, highlight the bad block and press <Delete>.

6. Repeat Steps 1 through 5 until you have entered all of the bad blocks on the manufacturer's bad block list.

7. Confirm the bad block list. When you have entered all of the bad blocks from the manufacturer's bad block list, press <Esc>.

   If you need to add or delete bad blocks from the table, answer "No" and return to "Entering the bad block list."

   If the table is correct and complete, answer "Yes" to the prompt and continue with the next instructions.

Formatting and testing the disk

Now the actual COMPSURF formatting and testing of the hard disks begins. Although you do not need to make any more keyboard entries until the testing is complete, you should monitor the progress of the test as outlined in the following process.

The information for each test assumes that you selected the recommended COMPSURF operation parameters (such as selecting to format the disk and repeating the surface analysis three times). If you have selected different parameters, you may see different messages than those documented here.

Formatting the disk

The first step in the COMPSURF process is to format the disk. While the disk is being formatted, a message like this appears on the screen:

```
The Drive is Being Formatted

Please Wait
```

The formatting process may take anywhere from a few minutes to several hours, depending on the type and size (storage capacity) of the disk.

The track zero test

After the disk has been formatted, the Track Zero Test begins. This test ensures that track zero on the disk is free from defects. During this test, the screen displays information in a format similar to the following:

```
Track Zero Test

Block #      Pattern        Pass    BadBlocks

 0            a5a5          1/20        0
```

As the Track Zero Test progresses, the numbers displayed in each column change continuously.

Running the Sequential Test

When the Track Zero Test is complete, the Sequential Test begins. This test searches for bad blocks (blocks on the disk that cannot store data reliably). The disk's bad block table consists of bad blocks discovered by the Sequential Test and the bad blocks that you entered manually from the manufacturer's bad block list.

While the Sequential Test is running, information in a format similar to the following is updated on the screen.

The columns in the screen are as follows:

Block #	The block number is the block currently being tested. This number counts down to zero for each of five data patterns.
Pattern	The "Pattern" column indicates the data pattern currently being written to the blocks on the disk.
Pass	The "Pass" column indicates how many passes of the Sequential Test have been completed out of the total number of passes you specified in the Program Operation Parameters.
Bad Blocks	The "Bad Blocks" column shows how many bad blocks have been located in the Sequential Test.

As indicated by the options in the "Sequential Test" submenu, you may interrupt the Sequential Test at any time to view or to print a listing of the bad blocks that have been found. You may also turn off the screen update to speed up the operation of the program. These options are explained in the following sections.

Displaying the bad block table

To display the bad blocks found by the Sequential Test, highlight "Display Bad Block Table" in the "Sequential Test" submenu. Then press <Enter>.

The information appears on the screen in a format similar to the following (do not be concerned if there are duplicate entries in the list):

```
Head    Cylinder

1          234
2          476
```

The program continues while the list is being displayed. To exit the bad block list, press <Esc>.

Printing the bad block table

If you have attached a parallel printer to the file server, you can print a list of the bad blocks found so far. Printing a partial list of bad blocks is optional. After the entire testing process is complete, you are instructed to print the complete bad block list.

Do not select the "Print the Bad Block Table" option if you have not attached a parallel printer to the file server. Without a printer, the COMPSURF utility may hang when you ask it to print out the test results.

To print a list of the bad blocks found so far, highlight "Print Bad Block Table" in the submenu. Then press <Enter>.

Turning off the screen update

You have the option to turn off the screen update for the Sequential Test. Turning off the screen update allows the test to run without constantly refreshing the screen display, which may reduce the time required to complete the Sequential Test. You can exercise this option at any time during the Sequential Test.

To turn off the screen update, highlight "Turn OFF Screen Update" in the submenu. Then press <Enter>. The information in the various columns on the screen is not updated until you turn on the screen update.

Turning on the screen update

To turn on the screen update after it has been turned off, highlight "Turn ON Screen Update" in the submenu. Then press <Enter>. The information in the various columns on the screen will once again be continuously updated as the program progresses.

The Sequential Test runs until the specified number of passes has been accomplished. Each pass of the Sequential Test takes approximately 30 to 45 minutes for a 20MB hard disk. The test will take longer for hard disks with larger storage capacity.

Running the Random Test

After the Sequential Test is finished, the Random Test automatically begins.

Note: If you specified zero passes of the Sequential Test, a Random Test Initialization procedure is run before the actual Random Test begins. The test initialization procedure initializes the disk's data storage area to prepare for the Random Test.

You may interrupt the Random Test at any time to view or to print a listing of the bad blocks that have been found. You may also turn off the screen update to speed up the operation of the program.

Recording the final bad block table

When all of the COMPSURF formatting and testing operations have been successfully completed, a message like this appears:

```
Surface Testing Finished - disk passed.

Display Bad Block Table
Print Bad Block Table
```

Note: If the disk did not successfully pass the COMPSURF testing, this is indicated on the screen. Replace the hard disk.

You should record the final bad block table (the bad blocks you entered from the manufacturer's bad block list and the bad blocks found during the COMPSURF testing). You can display the table on the screen and record the bad blocks by hand, or if you have a parallel printer attached to the file server you can print a hard copy of the final bad block table.

Select the appropriate choice from the menu on the screen to obtain a permanent record of the disk's bad block table.

You should always record the COMPSURF test results. If you do not, you will have no way to replace the bad block table if the table should ever be accidentally deleted. With a current record or printout, you have the information needed to re-enter the complete bad block table manually, if necessary.

Exiting COMPSURF

After you have recorded or printed the complete bad block list, press <Esc>. A prompt similar to the following appears:

```
Exit CompSurf

No
Yes
```

Answer "Yes."

If you need to run the COMPSURF utility for another disk drive, return to "Running COMPSURF" on page 279.

CONFIG

Use CONFIG to display the operating system's hardware configuration information for networks supported by the file server or router.

Command format

CONFIG

Using CONFIG

- CONFIG is coded into the file server operating system and ROUTER.EXE.
- Information similar to the following appears:

```
    Hardware Configuration Information for Server SERVER_NAME

Number of Service Processes:  10

LAN A Configuration Information:
    Network  Address:  [FEEDFEE5] [  1B203755]
    Hardware     Type:  NetWare NE/2 w/AT 2  v3.08EC (901010)
    Hardware Setting:  IRQ = 3, I/O Base = 1000h, no DMA or RAM

Disk Channel 0 Configuration Information:
    Hardware     Type:  IBM PS/2 SCSI Disk Driver  V1.03 (900830)
    Hardware Setting:  I/O = 3540h, Int = 14
```

Related commands

MONITOR

CONSOLE

Use CONSOLE to switch a nondedicated file server or router from workstation mode into console mode.

Command format

CONSOLE

Using CONSOLE

- CONSOLE is placed in SYS:LOGIN during installation when you choose to install a nondedicated file server.
- The console prompt appears on the screen and you must use NetWare console commands.
- Return to workstation mode by typing

  DOS <Enter>

Related commands

DOS

DCONFIG

Use DCONFIG to change the LAN driver configuration option, network address, node address (if the driver allows), disk controller type and configuration, and communication buffers.

Command format

DCONFIG [volume:]filename [option:parameter,...]

Using CONFIG

- DCONFIG is placed in SYS:SYSTEM during installation.
- Typing DCONFIG without parameters will display a list of valid parameters.

```
Usage: dconfig [volume:]file [parameter list]

Where [parameter list] is zero or more of:
  A-E: [net address], [node address], [configuration #];
  C0-7: [driver type], [configuration #];
  OTHER: [signature], [Configuration #];
  SHELL: [node address], [configuration #];
  BUFFERS: [number of buffers];
```

- Replace *filename* with NET$OS.EXE, ROUTER.EXE, or IPX.COM.
- Replace *option* with one of the items listed before the colon in the help screen.
- Replace *parameter* with one of the items listed after the colon in the help screen. Place a comma between or in place of unspecified parameters. See the NetWare installation supplement for available configuration options.
- Before running DCONFIG on NET$OS.EXE in SYS:SYSTEM, flag NET$OS.EXE SRW. After running DCONFIG, change the flag back to SRO then down and bring up your server to have the new settings take effect.
- DCB controllers are driver type 4, PS/2 (MFM) controllers 5, and ESDI controllers 6.
- DCONFIG replaces the SCONFIG used in NetWare v2.0.

DISABLE LOGIN

Use DISABLE LOGIN to prevent users from logging in to the file server when you need to make bindery repairs, back up files, or load software while the server is up.

This command is helpful if you want to use DISMOUNT and want to be sure no one logs in while you work with the volume.

Command format

DISABLE LOG[IN]

Using DISABLE LOGIN

- DISABLE LOGIN is coded into the file server operating system.
- Users already logged in to the file server are unaffected by the command until they log out.
- To re-enable login, use ENABLE LOGIN.

Related commands

ENABLE LOGIN
FCONSOLE (Status)
LOGIN

DISABLE TRANSACTIONS

Use DISABLE TRANSACTIONS to manually disable the NetWare Transaction Tracking System (TTS) in the file server. This is primarily a tool for application developers who need to test transactional applications with TTS disabled.

Command format

DISABLE TRANSACTIONS

Using DISABLE TRANSACTIONS

- DISABLE TRANSACTIONS is coded into the file server operating system.
- TTS is an integral part of the file server operating system that protects the bindery and any other files that have been flagged as transactional from becoming corrupted. During normal operation, you do not need to manually disable TTS; the file server will automatically disable TTS if it is necessary.
- Since TTS does not use a significant amount of file server memory (about 40 bytes for most transactions and at maximum 400KB), disabling TTS is not an efficient way to free up file server memory.
- TTS will remain disabled until you enable it with ENABLE TRANSACTIONS or reboot the file server.

Related commands

ENABLE TRANSACTIONS
FCONSOLE (Status)
SETTTS

DISK

Use DISK to monitor the status of network disk drives. DISK shows which disks are functioning normally and which are not.

Command format

DISK [*|volume name]

Using DISK

- DISK is coded into the file server operating system.
- Correct all abnormal conditions indicated by DISK before you reboot the file server.
- DISK, DISK *, or DISK volume name for dedicated or nondedicated file servers.

What DISK does

Information similar to the following appears:

PHYSICAL DISK STATUS AND STATISTICS

	cha	con	drv	stat	IO Err	Free	Used
00	1	0	0	OK	0	699	8
01	1	0	1	OK	0	0	8
02	2	0	0	NO HOT	0	0	0
03	2	0	1	OFF	0	0	0

The following chart explains information for each column.

Column	Information	Explanation
	00,01,02,etc. through 32	Drive number assigned by operating system for each drive installed. Used as a reference for mirrored pairs and in system messages.
cha	0,1,2,3, or 4	Channel number in which disk controller, DCB, or third-party disk interface board is installed.
con	0,1,2,3,4,5,6, or 7	Address set on controller for disk.
drv	0,1	Disk address.
stat	OK	Drive is set up for Hot Fix and is not mirrored.
	NO HF	Hot Fix has been shut off. The drive will automatically shut down, and should be repaired and reinstalled with Hot Fix as soon as possible. (See maintenance.)
	DOWN	Drive is not operating. The drive should be repaired (if possible), and reinstalled with Hot Fix as soon as possible. (See maintenance.)
	M-xx (dedicated only)	Drive is mirrored (or duplexed). xx is the drive number for the other drive in the mirrored pair.
	D-xx (dedicated only)	Drive was set up for mirroring (or duplexing) but is now "dead." The drive should be shut down, repaired (if possible), reinstalled with Hot Fix, and remirrored as soon as possible. (See Maintenance.) xx is the drive number for the other drive in the mirrored pair. The other drive should now show "OK" status. However, it is no longer mirrored (or duplexed) and should be restored to its original status as soon as possible.
IO Err	00000,00001, etc.	The number of input/output errors that have occurred on the drive. In other words, how many times data has been redirected on the drive.
Free	0000,0001, etc.	How many blocks in the disk's redirection area are unused. (Free plus Used equals the original number set aside for the redirection area.)
Used	0000,0001, etc.	How many blocks in the disk's redirection area are used. (Free plus Used equals the original number set aside for the redirection area.) Hot Fix uses 6 blocks, so this number will not be zero even if no blocks are redirected.

What DISK * does

Information similar to the following appears:

```
                    FILE SERVER VOLUMES
Volume Name          Phy Drv          Mir Drv
    SYS                00               01
    VOL1               02
    ACCT               03
```

The following chart explains information for each column.

Column	Information	Explanation
Volume Name	Names of file sever volumes	Listing of the mounted volumes on the file server.
Phy Drv	00, 01, etc. through 32	Drive number assigned by the operating system. Unmirrored drives and primary drives of a mirrored pair appear.
Mir Drv	00, 01, etc. through 32	Drive number of secondary drive in mirrored pair. Primary drive appears under Phy Drv on the same line.

What DISK volume name does

Information similar to the following appears:

```
        Information For Volume SYS

Physical drive number       : 00
Physical drive type         : ISA Disk type 09
IO errors on this drive     :      0
Redirection blocks available:  223
Redirection blocks used     :    9

Mirror physical drive number:  01

Other volumes sharing these physical drive(s):
VOL1
```

Information about the unmirrored or primary disk containing the volume is displayed first. "Physical drive number" is the drive number assigned by the operating system.

If the disk is mirrored, information about the secondary disk is also given. "Mirror physical drive number" is the drive number assigned by the operating system.

:DOWN DISKSET

Use DISKSET to place identification information about external hard disks on the EPROM chip of a Host Bus Adaptor (HBA). This configuration information allows the file server to communicate with the drives through the HBA.

Note: If you are installing an IBM PC AT or compatible, or an IBM PS/2 as your file server, the internal hard disk configuration should have been programmed with the SETUP (or equivalent) utility or the *IBM PS/2 REFERENCE* diskette, as part of the initial hardware setup.

Command format

DISKSET

Preparing to run DISKSET

Before you start DISKSET you will need the following information about each external hard disk you have attached to an HBA in the file server:

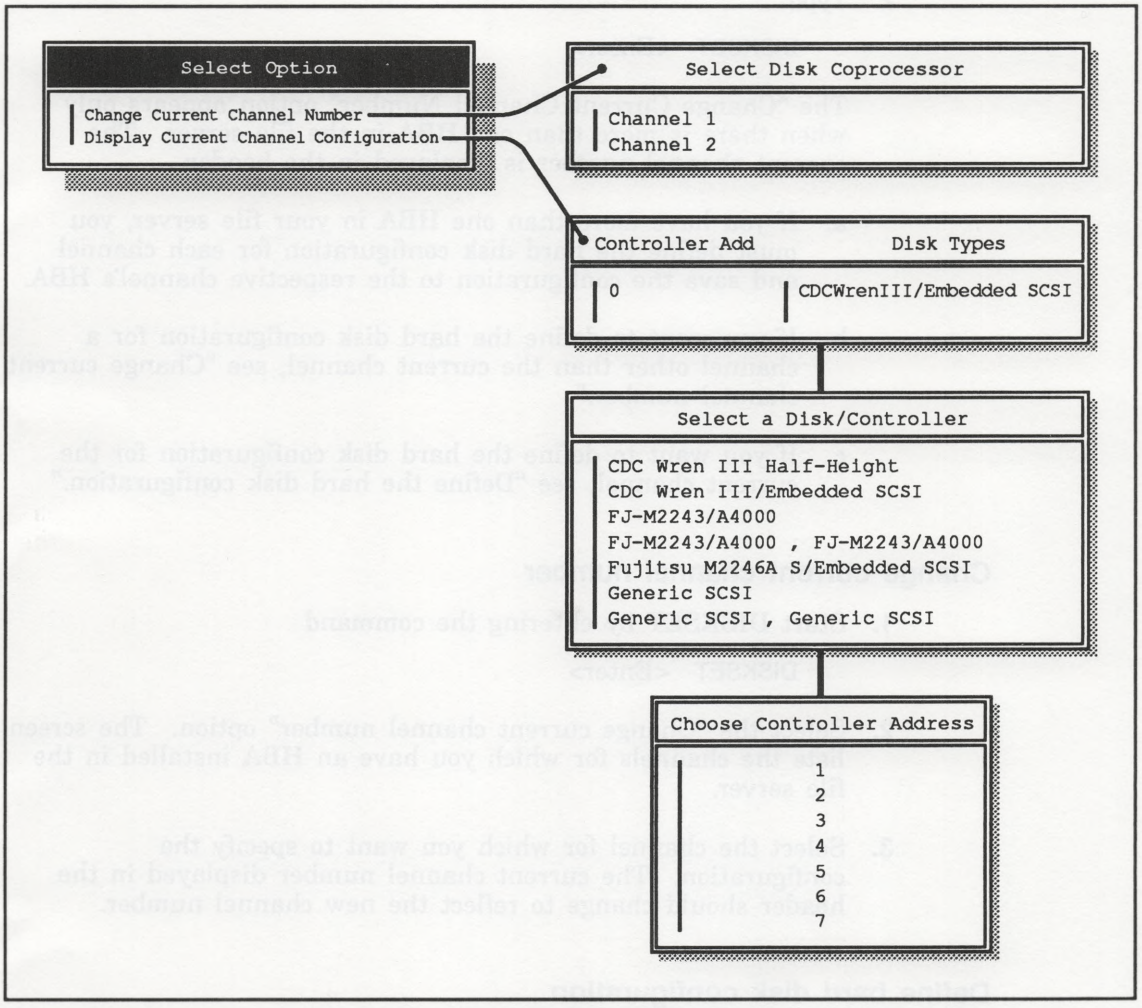
- The "disk type" which includes the disk manufacturer's name and model number (Toshiba MK56, Vertex V185) and the type of hard disk controller board to which the disk is attached (Adaptec 4000, Adaptec 4070, or Embedded SCSI).
- The "controller address" which is the controller number (0, 1, 2, 3, 4, 5, 6, or 7) that was physically set on each controller when the hard disks and disk subsystems were prepared for installation.
- The channel number.

Note: Do not confuse hard disk controllers with HBAs. A single HBA serves as the interface between the file server and all of the hard disks on a particular hard disk channel. Up to eight hard disk controllers can be attached within a channel; each controller services either one or two hard disk drives.

During installation this information should be recorded on the "External Hard Disk" worksheet in the *Installing and Maintaining the Network* manual.

DISKSET menu flow

The following figure shows an overview of the menu structure in DISKSET.



DISKSET Overview

1. DISKSET is found on the *SYSTEM-1* diskette. Either map a drive to the *SYSTEM-1* directory on the network or insert the *SYSTEM-1* diskette into drive A.

2. Type

   DISKSET <Enter>

   The "Change Current Channel Number" option appears only when there is more than one HBA in the file server. The current channel number is displayed in the header.

   a. If you have more than one HBA in your file server, you must define the hard disk configuration for each channel and save the configuration to the respective channel's HBA.

   b. If you want to define the hard disk configuration for a channel other than the current channel, see "Change current channel number."

   c. If you want to define the hard disk configuration for the current channel, see "Define the hard disk configuration."

Change current channel number

1. Start DISKSET by entering the command

   DISKSET <Enter>

2. Select the "Change current channel number" option. The screen lists the channels for which you have an HBA installed in the file server.

3. Select the channel for which you want to specify the configuration. The current channel number displayed in the header should change to reflect the new channel number.

Define hard disk configuration

1. To specify the hard disk configuration for the hard disk channel displayed in the DISKSET screen header, select "Display Current Channel Configuration."

   Information currently on the HBA's EPROM will be displayed in the window.

2. To add a disk/controller combination to the current channel's hard disk configuration, press <Insert>. A list of the hard disk/controller combinations currently supported by NetWare v2.2 will appear.

3. Select one of the disk/controller combinations that exists within the current hard disk channel. If necessary, use the arrow keys to scroll through the list displayed in the window.

   If you are not sure which item in the list represents your particular disk/controller combination, consider the following:

   - **A single hard disk**. Look for this format:

     Disk type/controller type

     For example, if you have added a NetWare-Ready drive, you would choose "NetWareReady/Embedded SCSI" from the list.

   - **Two hard disks**. Look for this format:

     Disk type/controller type , Disk type/controller type

     For example, if somewhere in the hard disk channel you have an Adaptec 4070 controller board with two Maxtor-1140 hard disks attached to it, you would choose "Maxtor-1140/A4070, Maxtor-1140/A4070" from the list.

   - **Embedded SCSI hard disks**. Look for this format:

     Disk type/controller type

     For example, if somewhere in the hard disk channel you have a CDC Wren III disk, you would choose "CDC Wren III/Embedded SCSI" from the list.

4. Select the correct controller address (0-7) of the disk/controller combination.

   The controller address you set on each controller in your hard disk channels should already be recorded on the "External Hard Disk" worksheet. If it is not, refer to the documentation accompanying your hardware for information on how to read the controller address setting on a controller.

5. Repeat Steps 1 through 4 for any remaining hard disk/controller combinations in the current hard disk channel.

   If you need to delete a disk/controller combination that has already been selected, highlight the item you want to delete and press <Delete>.

6. When you have defined all of the hard disk/controller combinations in the current hard disk channel, press <Esc>. Answer "Yes" to the prompt.

You must define the hard disk configuration for each channel you have set up. Repeat Steps 1-6 for each channel set up.

Where to go next

After you have run DISKSET, return to the INSTALL utility. If you are installing a new disk drive, you must run ZTest before NetWare can access the drive.

DISMOUNT

Use DISMOUNT to make a removable volume unavailable to your users. You can mount and dismount one or more removable volumes while the file server is running.

Command format

DISMOUNT volume_number

Using MOUNT

- DISMOUNT is coded into the file server operating system.
- You must mount a volume before you can dismount it.
- The volume number is in the range of 1 to 31. Volume number 0 is volume SYS: and cannot be dismounted.

Related commands

MOUNT

DISPLAY NETWORKS

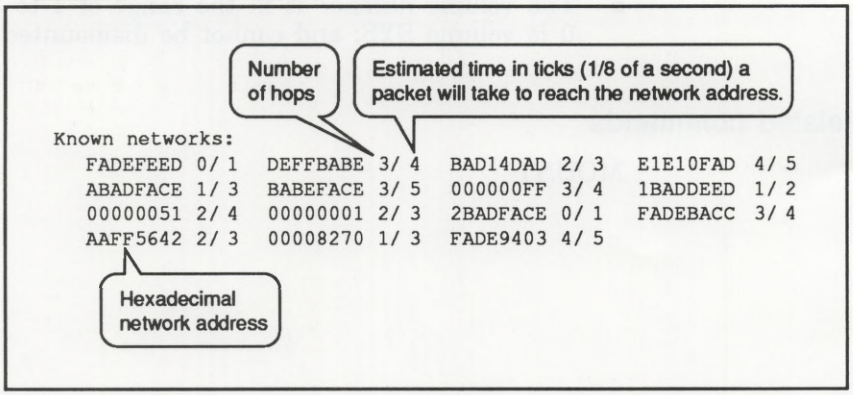
Use DISPLAY NETWORKS to list all the networks that the file server or router is aware of.

Command format

DISPLAY NETWORKS

Using DISPLAY NETWORKS

- DISPLAY NETWORKS is coded into the file server operating system and ROUTER.EXE.
- Information similar to the following appears:


Number of hops
Estimated time in ticks (1/8 of a second) a packet will take to reach the network address.
Known networks:
FADEFEED 0/ 1 DEFFBABE 3/ 4 BAD14DAD 2/ 3 E1E10FAD 4/ 5
ABADFACE 1/ 3 BABEFACE 3/ 5 000000FF 3/ 4 1BADDEED 1/ 2
00000051 2/ 4 00000001 2/ 3 2BADFACE 0/ 1 FADEBACC 3/ 4
AAFF5642 2/ 3 00008270 1/ 3 FADE9403 4/ 5
Hexadecimal network address

- To see a list of servers on the network, use the DISPLAY SERVERS command.

Related commands

DISPLAY SERVERS

DISPLAY SERVERS

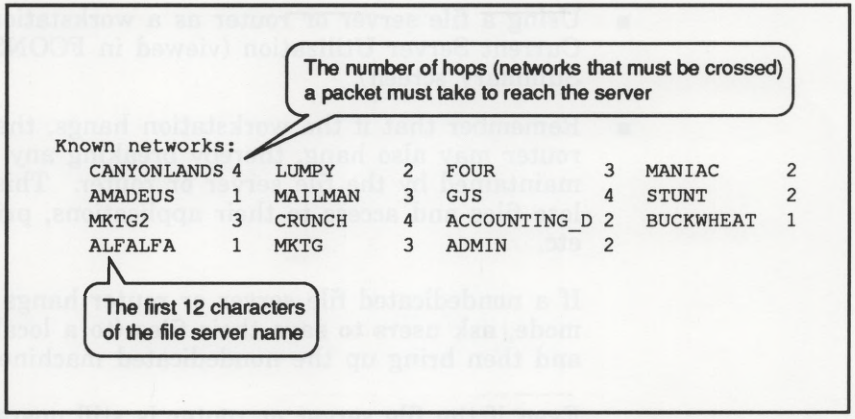
Use DISPLAY SERVERS to list all servers that the file server or router is aware of.

Command format

DISPLAY SERVERS

Using DISPLAY SERVERS

- DISPLAY SERVERS is coded into the file server operating system and ROUTER.EXE
- Information similar to the following appears:


The number of hops (networks that must be crossed) a packet must take to reach the server
Known networks:
CANYONLANDS 4 LUMPY 2 FOUR 3 MANIAC 2
AMADEUS 1 MAILMAN 3 GJS 4 STUNT 2
MKTG2 3 CRUNCH 4 ACCOUNTING_D 2 BUCKWHEAT 1
ALFALFA 1 MKTG 3 ADMIN 2
The first 12 characters of the file server name

To see a list of networks, use the DISPLAY NETWORKS command.

Related commands

DISPLAY NETWORKS

DOS

Use DOS to switch a nondedicated file server or router from console mode to local DOS mode. You can then use it as a workstation, even though it is still functioning as a file server or router.

Command format

DOS

Using DOS

- DOS is coded into the nondedicated file server operating system and ROUTER.EXE.
- Using a file server or router as a workstation greatly increases Current Server Utilization (viewed in FCONSOLE's Statistics Summary screen).
- Remember that if the workstation hangs, the file server or router may also hang, thereby breaking any connections maintained by the file server or router. This causes users to lose files and access to their applications, printers, disk storage, etc.

  If a nondedicated file server or router hangs in DOS or console mode, ask users to save their files (to a local disk if necessary), and then bring up the nondedicated machine again.

  Even if the file server or router is still operating, you will have to reboot the computer to get the workstation back to normal operation; this causes the file server or router to be taken down.
- To switch back to file server mode, enter CONSOLE at the DOS prompt.

Related commands

CONSOLE

DOSGEN

Use DOSGEN to create remote boot image files on a file server. These image files allow DOS and diskless workstations to boot from the file server rather than from boot files on a local drive.

Command format

DOSGEN

Prepare to run DOSGEN

- DOSGEN is placed in SYS:SYSTEM during installation.
- Refer to "Set up remote reset workstation boot" on page 30. Also see **Remote boot** in *Concepts* for complete remote boot information.
- Unless you specify another name, DOSGEN names the remote boot image file NET$DOS.SYS and places it in the SYS:LOGIN directory. If a NET$DOS.SYS file already exists, follow the instructions for multiple remote boot image files on the next page so you do not overwrite the existing file.
- If you use different boot files (setups) for remote boot workstations, each setup must have its own remote boot image file created by DOSGEN. See "Create multiple remote boot image files" on the next page.
- If you are installing only diskless workstations on a network, you must, at least temporarily, use a workstation with a floppy drive to run DOSGEN.
- Prepare a boot diskette for each remote boot workstation setup. Use the "DOS Workstation Configuration Worksheet" in *Installing and Maintaining the Network* to determine how many different setups you will need to support.
- If you need to create only one remote boot image file, follow the instructions under "Create a single remote boot image file." If you need to create more than one remote boot image file, go to "Create multiple remote boot image files."

How to run DOSGEN

Create a single remote boot image file

1. Log in as SUPERVISOR on the file server the workstations will remote boot from.

2. Insert the boot diskette for the remote boot workstation into drive A.

3. Map drive F to SYS:SYSTEM and drive G to SYS:LOGIN, then change to drive G.

4. Type

   F:DOSGEN <Enter>

   Information similar to the following appears:

```
Floppy Type f9 = Quad Density, 15 Sectors per track
Total Floppy Space 2400 Sectors
Setting Up System Block.
Setting Up FAT Tables.
Setting Up Directory Structures.
Traversing Directory Structures.
Processing IBMBIO  COM
Processing IBMDOS  COM
Processing COMMAND COM
Processing IPX     COM
Processing NET3    COM
Processing AUTOEXECBAT
Transferring Data to "NET$DOS.SYS"
```

5. Flag the NET$DOS.SYS file in SYS:LOGIN Shareable Read-only by typing

   FLAG NET$DOS.SYS SRO <Enter>.

Create multiple remote boot image files

You should have prepared each boot diskette's AUTOEXEC.BAT file as specified in step 5 on page 33 before following these instructions.

1. Log in as SUPERVISOR on the file server the workstations will remote boot from.

2. Insert the boot diskette for the remote boot workstation type into drive A.

3. Map drive F to SYS:SYSTEM and drive G to SYS:LOGIN, then change to drive G.

4. Run DOSGEN and indicate a new name for the image file. We recommend the same root number as for the renamed AUTOEXEC.BAT file on the diskette (AUTO1.BAT and BOOTDSK1.SYS, for example). Type

   F:DOSGEN a:BOOTDSKx.SYS <Enter>

   Information similar to the following appears:

```
Floppy Type f9 = Quad Density, 15 Sectors per track
Total Floppy Space 2400 Sectors
Setting Up System Block.
Setting Up FAT Tables.
Setting Up Directory Structures.
Traversing Directory Structures.
Processing IBMBIO  COM
Processing IBMDOS  COM
Processing COMMAND COM
Processing IPX     COM
Processing NET3    COM
Processing AUTOEXECBAT
Transferring Data to "BOOTDSK1.SYS"
```

5. Flag the newly created boot image file Shareable Read-only by typing

   FLAG BOOTDSKx.SYS SRO <Enter>

6. Repeat these instructions for the boot diskette for each workstation type.

Related commands

FLAG
GRANT
LOGIN
MAP

DOWN

Use DOWN to clear cache buffers, close files, and shut down the operating system before turning off the power to a file server or router. DOWN ensures data integrity on a file server by writing all cache buffers to disk, closing all files, and updating the appropriate directory and file allocation tables. DOWN also logically dismounts all volumes.

Command format

DOWN

Using DOWN

- DOWN is coded into the file server operating system and ROUTER.EXE.
- You should never down a file server until you are sure that all workstations are logged out. Use FCONSOLE or SESSION to make sure all workstations have logged out.
- Use BROADCAST, FCONSOLE, SESSION, or SEND to inform users that they should close all files and log out. Do this before you down a file server or a router connecting users to a file server.

Related commands

BROADCAST
FCONSOLE (Down File Server)
MONITOR
SEND
SESSION

DSPACE

Use DSPACE to limit a user's available disk space on all volumes of the file server.

Command format

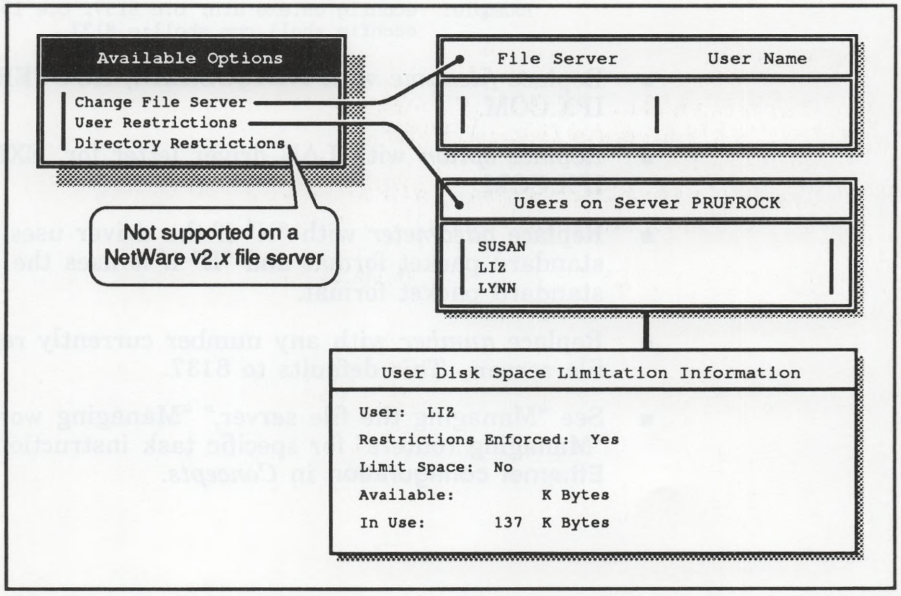
DSPACE

Using DSPACE

- DSPACE is placed in SYS:PUBLIC during installation.
- To limit user disk space on a v2.2 file server, you must choose to limit disk space while running INSTALL.

An overview of DSPACE

The figure below illustrates the "Available Topics" menu and the submenus that are accessible from each option.



ECONFIG

Use ECONFIG to view or configure NetWare Ethernet LAN drivers to the Ethernet II or the IEEE 802.3 standard.

Command format

ECONFIG [volume:]filename [option:parameter, [number]]

Using CONFIG

- ECONFIG is found on the following diskettes: *WSGEN*, *ROUTEGEN*, and *LAN_DRV_001*.
- Typing ECONFIG alone displays the following help screen:

```
Usage:  econfig [volume:]file [parameter list]

[parameter list] is one of the following:
 SHELL:[configuration type]
   A-D:[configuration type]
       [configuration type]=N, E [type constant]
       [type constant]=0-FFFF

  Example:  econfig os.exe a:n; b:e 8137; c:e 15af
            econfig shell.com shell:e 8137
```

- Replace *filename* with NET$OS.EXE, ROUTER.EXE, or IPX.COM.
- Replace *option* with LAN driver letter for .EXEs and SHELL for IPX.COM.
- Replace *parameter* with "N" if the driver uses the IEEE 802.3 standard packet format and "E" if it uses the Ethernet II standard packet format.
- Replace *number* with any number currently registered with your file server. This defaults to 8137.
- See "Managing the file server," "Managing workstations," and "Managing routers" for specific task instructions. See also **Ethernet configuration** in *Concepts*.

ENABLE LOGIN

Use ENABLE LOGIN to re-enable the login function after you have disabled it with DISABLE LOGIN.

Command format

ENABLE LOG[IN]

Using ENABLE LOGIN

- ENABLE LOGIN is coded into the file server operating system.
- If you have downed the file server since using DISABLE LOGIN, the login function is enabled automatically when you boot the file server.

Related commands

DISABLE LOGIN
FCONSOLE (Status)
LOGIN

ENABLE TRANSACTIONS

Use ENABLE TRANSACTIONS to manually enable the NetWare Transaction Tracking System (TTS) in the file server after TTS has been disabled (automatically or manually).

Command format

ENABLE TRANSACTIONS

Using ENABLE TRANSACTIONS

- ENABLE TRANSACTIONS is coded into the file server operating system.
- During normal operation, TTS is always enabled. You can manually disable TTS with DISABLE TTS. Also, the file server will automatically disable TTS if either the TTS backout volume (usually SYS) gets full, or the file server has insufficient memory to operate TTS.
- When TTS is not enabled, enter ENABLE TRANSACTIONS at the file server console to re-enable it.
- Transactions that were initiated while TTS was disabled cannot be backed out after TTS is re-enabled.

Related commands

DISABLE TRANSACTIONS
FCONSOLE (Status)
SETTTS

ENDCAP

Use ENDCAP to end the capture of one or more of your workstation's local LPT ports. You can also use ENDCAP to send data to a network printer or a file. (You will always use CAPTURE before using ENDCAP; see CAPTURE.)

Command format

ENDCAP [option ...]

Using ENDCAP

Replace *option* with one or more of the options listed below. If you do not specify an option, ENDCAP will end the capture of LPT1.

Option	Function	Variable	Default
Local=n	Indicate which LPT port to end the capture of (1, 2, or 3).	1, 2, or 3, indicating LPT1, LPT2, or LPT3.	1
ALL	End the capture of all LPT ports.	n/a	n/a
Cancel	End the capture of LPT1 and discard data without printing it.	n/a	n/a
Cancel Local=n	End the capture of the specified LPT port and discard data without printing it.	1, 2, or 3, indicating LPT1, LPT2, or LPT3.	1
Cancel **ALL**	End the capture of all LPT ports and discard data without printing it.	n/a	n/a

FCONSOLE

Use FCONSOLE to analyze a file server's operation in order to fine tune its performance.

Experienced network programmers can use FCONSOLE to obtain information for writing, testing, and debugging multiuser programs.

Command format

FCONSOLE

FCONSOLE overview

Tasks you can perform with FCONSOLE depend on the type of user you are.

General users

General users can use FCONSOLE to change file servers, view user connection information, view a file server's LAN driver information, and view the version of NetWare running on the file server.

Console operators

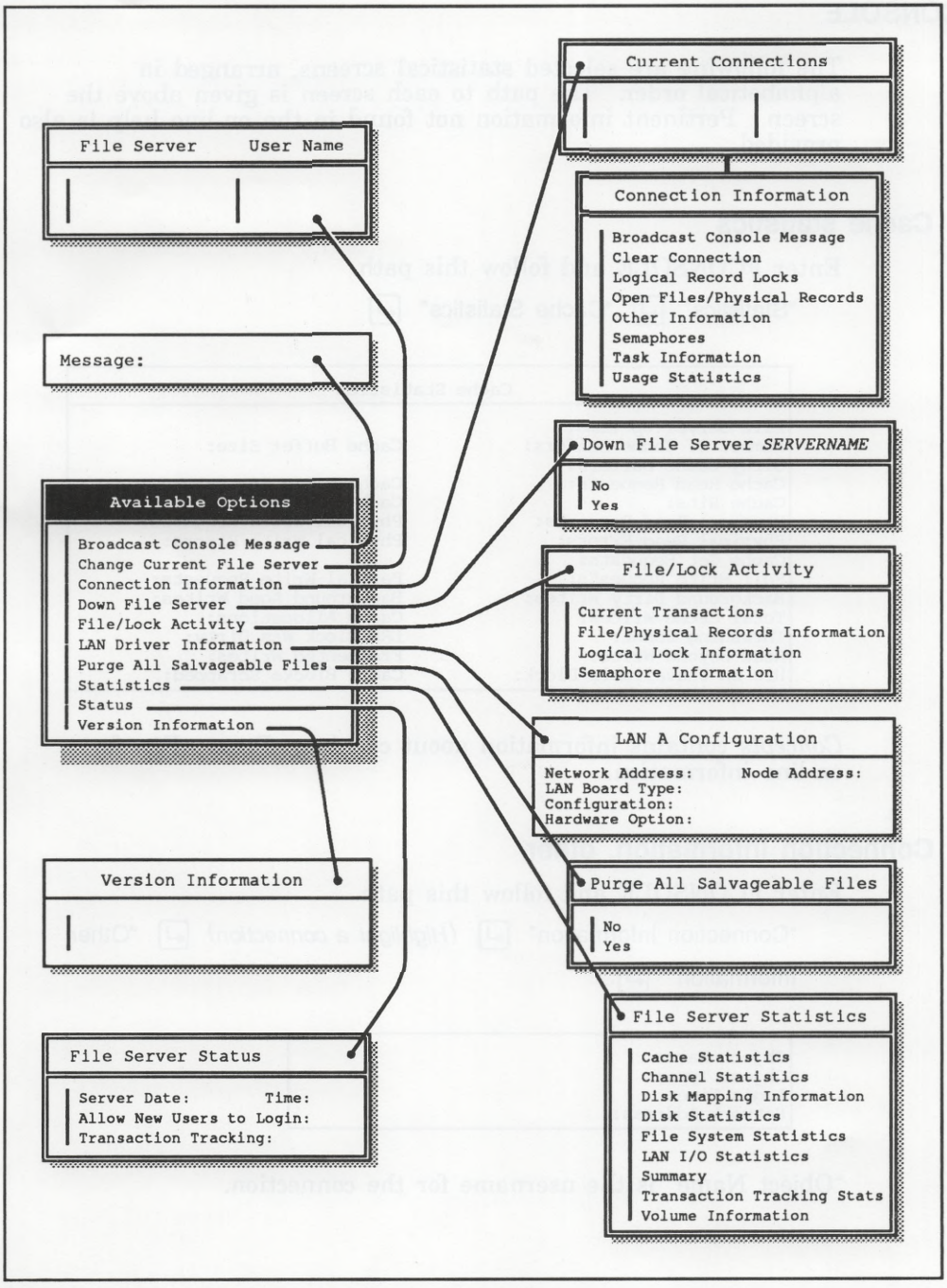
Console operators can also broadcast messages, purge salvageable files, view detailed user connection information, view file and lock activity, see and alter the status of the file server, and view statistics about file server performance.

System supervisors

Supervisors can also bring down a file server and clear a user's connection.

FCONSOLE menu flow

The following figure illustrates the path to most of the task-oriented and statistical screens. To find information on the kinds of tasks you can perform in a screen, use on-line help (<F1>) when you are in that screen.



FCONSOLE Overview

The following are selected statistical screens, arranged in alphabetical order. The path to each screen is given above the screen. Pertinent information not found in the on-line help is also provided.

Cache statistics

Enter FCONSOLE and follow this path.

"Statistics" ↵ "Cache Statistics" ↵

```
                        Cache Statistics

File Server Up Time:
Number Of Cache Buffers:            Cache Buffer Size:
Dirty Cache Buffers:
Cache Read Requests:                Cache Write Requests:
Cache Hits:                         Cache Misses:
Physical Read Requests:             Physical Write Requests:
Physical Read Errors:               Physical Write Errors:
Cache Get Requests:
Full Write Requests:                Partial Write Requests:
Background Dirty Writes:            Background Aged Writes:
Total Cache Writes:                 Cache Allocations:
Thrashing Count:                    LRU Block Was Dirty:
Read Beyond Write:                  Fragmented Writes:
Hit On Unavailable Block:           Cache Blocks Scrapped:
```

Concepts contains information about caching. Press <F1> for on-line information.

Connection information, other

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Highlight a connection)* ↵ "Other Information" ↵

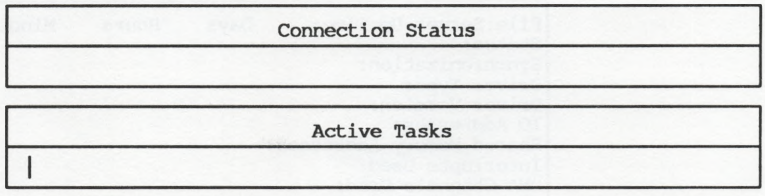
```
Object Name:
Object Type:
Login Time:
Network Address:
```

"Object Name" is the username for the connection.

Connection information, status and active tasks

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Highlight a connection)* ↵ "Task Information" ↵



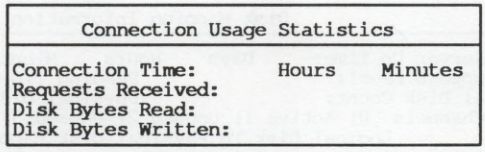
"Status" indicates whether a connection is waiting for a lock or semaphore. "Task" indicates which tasks the connection is performing.

Connection usage statistics

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Highlight a connection)* ↵

"Usage Statistics" ↵



The screen shows the total disk I/O and packet requests for a selected connection since the object (user) logged in to the file server.

Disk channel statistics

Enter FCONSOLE and follow this path.

"Statistics" ↵ "Channel Statistics" ↵

```
                        Disk Channel nn

File Server Up Time:     Days    Hours    Minutes    Seconds
Status:
Synchronization:
Driver Type:
Driver Version:
IO Addresses:
Shared Memory Addresses:
Interrupts Used:
DMA Channels Used:
Channel Configuration:
```

The screen shows configuration information for a given channel. Use this information when installing additional disks and disk drivers to avoid setting conflicting addresses.

Disk mapping information

Enter FCONSOLE and follow this path.

"Statistics" ↵ "Disk mapping Information" ↵

```
                     Disk Mapping Information

File Server Up Time:      Days    Hours    Minutes    Seconds
SFT Support Level:                  Pending I/O Commands:
Logical Disk Count:                 Physical Disk Count:
Disk Channels  0) Active 1) Unused 2) Unused 3) Unused 4) Unused
              Logical Disk To Physical Disk Mappings
   Primary  Mirror      Primary  Mirror      Primary  Mirror
 0)                   11)                  22)
 1)                   12)                  23)
 2)                   13)                  24)
 3)                   14)                  25)
 4)                   15)                  26)
 5)                   16)                  27)
 6)                   17)                  28)
 7)                   18)                  29)
 8)                   19)                  30)
 9)                   20)                  31)
10)                   21)
```

The screen indicates how the disk elevator (Pending I/O Commands) is performing, and gives information regarding disk mirroring.

Disk statistics

Enter FCONSOLE and follow this path.

"Statistics" ↵ "Disk Statistics" ↵

```
                        Physical Disk  nn

File Server Up Time:     Days     Hours     Minutes     Seconds
Disk Type:

Disk Channel:        Controller Number:        Drive Number:
Controller Type:
Drive Size (less hot fix area):
Drive Cylinders:          Drive Heads:     Sectors Per Track:
IO Error Count:
Hot Fix Table Start:
Hot Fix Table Size:                    Hot Fix Remaining:
```

The screen displays information about individual disk drives attached to the file server including Hot Fix information.

File server statistics summary

Enter FCONSOLE and follow this path.

"Statistics" ↵ "Summary" ↵

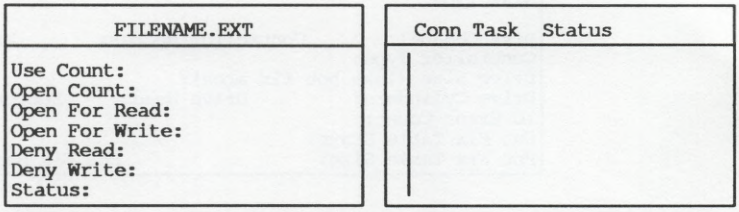
```
                    File Server Statistics Summary

File Server Up Time:      Days     Hours     Minutes     Seconds
Number Of File Service Processes:     Current Server Utilization:
Disk Requests Serviced From Cache:    Packets Routed:
Total Packets Received:               File Service Packets:
Total Number Of Cache Buffers:        Dirty Cache Buffers:
Total Server Memory:                  Unused Server Memory:

                       Maximum     Peak Used    Currently In Use
Routing Buffers:
Open Files:
Indexed Files:
Transactions:
Bindery Objects:
Connections:
Dynamic Memory 1:
Dynamic Memory 2:
Dynamic Memory 3:
Dynamic Memory 4:
```

The screen displays a summary of information about file server performance, including memory usage.

File status

Enter FCONSOLE and follow this path.

"File/Lock Activity" ↵ "File/Physical Records Information" ↵ *(Specify a directory path)* ↵ *(Specify a filename)* ↵ "File Status" ↵

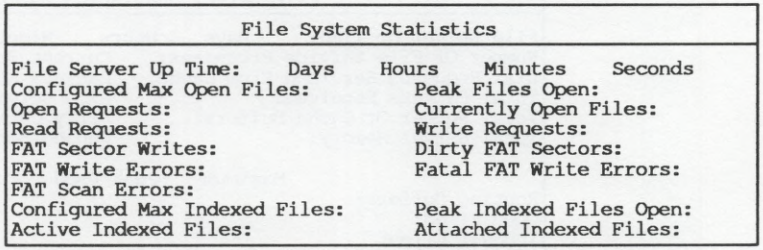


The screen displays information about current usage for a given file, including how the file is being used and by which connections.

File system statistics

Enter FCONSOLE and follow this path.

"Statistics" ↵ "File System Statistics" ↵

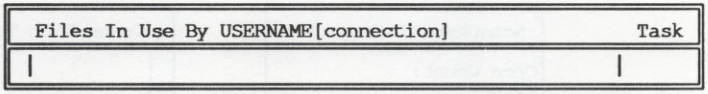


The screen displays information to help you determine whether you are optimizing your file use or whether memory allocated to file creation can be better used elsewhere.

Files in use

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Highlight a connection)* ↵ "Open Files/Physical Records" ↵

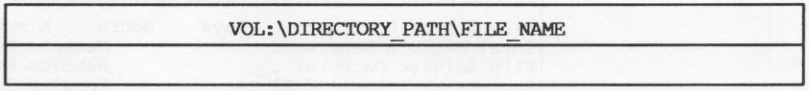


The list shows all files that the selected connection has open or has logged. The complete path from the volume to the file is shown, as well as how the file is being used (the task).

Files in use, status

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Highlight a connection)* ↵ "Open Files/Physical Records" ↵ *(Highlight an open file)* ↵ "File Status" ↵

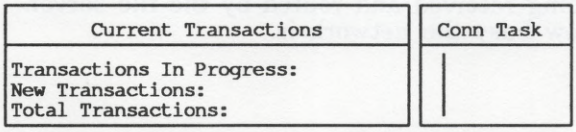


The screen displays the status of a selected file being used by a selected connection. File status indicates the kinds of tasks that can be performed on the file.

File/lock, current transactions

Enter FCONSOLE and follow this path.

"File/Lock Activity" ↵ "Current Transactions" ↵



The screen shows information about the transactions being tracked by the Transaction Tracking System (dedicated file servers only).

File/lock, semaphore information

Enter FCONSOLE and follow this path.

"File/Lock Activity" ↵ "Semaphore Information" ↵ *(Specify a semaphore name)* ↵

Semaphore Information
Open Count: Value:

Connection Task
|

The screen displays information about a specified semaphore. If you don't know the name of the semaphore, you may be able to find it by examining a connection that you know is using the semaphore.

LAN I/O statistics

Enter FCONSOLE and follow this path.

"Statistics" ↵ "LAN I/O Statistics" ↵

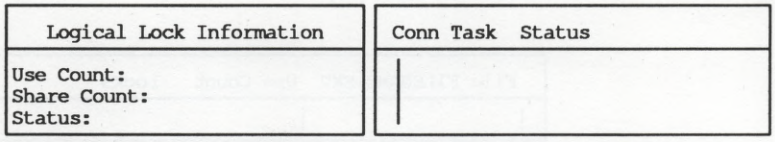
LAN I/O Statistics
File Server Up Time: Days Hours Minutes Seconds Total Packets Received: Packets Routed: File Service Packets: NetBIOS Broadcasts: Packets With Invalid Slots: Invalid Connections: Invalid Sequence Numbers: Invalid Request Types: Detach With Invalid Slot: Forged Detach Requests: New Request During Processing: New Attach During Processing: Ignored Duplicate Attach: Reply Canceled By New Attach: Detach During Processing Ignored: Reexecuted Requests: Duplicate Replies Sent: Positive Acknowledges Sent: File Service Used Route: Packets Discarded Because They Crossed More Than 16 Bridges: Packets Discarded Because Destination Network Is Unknown: Incoming Packets Lost Because Of No Available Buffers: Outgoing Packets Lost Because Of No Available Buffers:

The screen displays information about the communication packets being received and routed by the file server. Information indicates how busy the network is.

Logical lock Information

Enter FCONSOLE and follow this path.

"File/Lock Activity" ↵ "Logical Lock Information" ↵ *(Specify a logical record name)* ↵

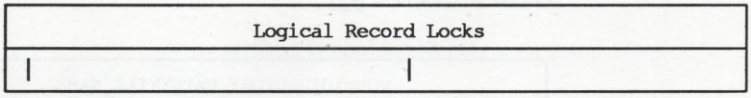


Logical record locks are used by programs to control data access by multiple users. The screen shows all the connections using a specific logical record lock and shows the status of the lock.

Logical record locks

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Specify a connection)* ↵ "Logical Record Locks" ↵



This screen displays all logical record locks the selected connection has logged with the server.

Physical record lock information

Enter FCONSOLE and follow this path.

"File/Lock Activity" ↵ "File/Physical Records Information" ↵ *(Specify a directory path)* ↵ *(Specify a file name)* ↵ "Physical Record Locks" ↵

File FILENAME.EXT	Use Count	Locks

Physical record locks prevent another station from accessing or changing a range of bytes (a record) in a file. This window shows all physical record locks that connections have on a selected file.

Physical record locks

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Highlight a connection)* ↵ "Open Files/Physical Records" ↵ *(Highlight an open file)* ↵ "Physical Record Locks" ↵

VOL:\DIRECTORY_PATH\FILE_NAME

The screen shows all physical record locks that a selected connection has on a selected file.

Semaphores in use by a connection

Enter FCONSOLE and follow this path.

"Connection Information" ↵ *(Highlight a connection)* ↵ "Semaphores" ↵

Semaphore Name	Task	Open Count	Value

Semaphores limit how many tasks can use (or change) a resource at the same time, and the number of workstations that can run a program at the same time.

TTS statistics

Enter FCONSOLE and follow this path.

"Statistics" ↵ "Transaction Tracking Statistics" ↵

```
                    Transaction Tracking Statistics

File Server Up Time:      Days     Hours     Minutes     Seconds
Transaction Tracking Status:
Transaction Tracking Volume: SYS
Configured Max Transactions:        Peak Transactions:
Current Transactions:
Transactions Performed:             Transactions Written:
Requested Backouts:                 Unfilled Backout Requests:
Current Used Disk Space:            Total File Extensions:
Total File Size Changes:            Total File Truncations:
```

The screen displays information about the file server's TTS performance (dedicated file server only).

Volume information

Enter FCONSOLE and follow this path.

"Statistics" ↵ "Volume Information" ↵ *(Highlight a volume name)* ↵

```
                      Volume Information

File Server Up Time:      Days     Hours     Minutes     Seconds
Volume Name:                        Volume Number:
Volume Mounted:                     Volume Removable:
Volume Hashed:                      Volume Cached:
Block Size:                         Starting Block:
Total Blocks:                       Free Blocks:
Maximum Directory Entries:
Peak Directory Entries Used:
Current Free Directory Entries:
Logical Drive Number:
Volume Mirrored:
Primary Disk Number:                Mirror Disk Number:
```

The screen displays statistics about a selected file server volume.

FILER

Use FILER to view and control directory and file information and security.

Command format

FILER

FILER overview

Features

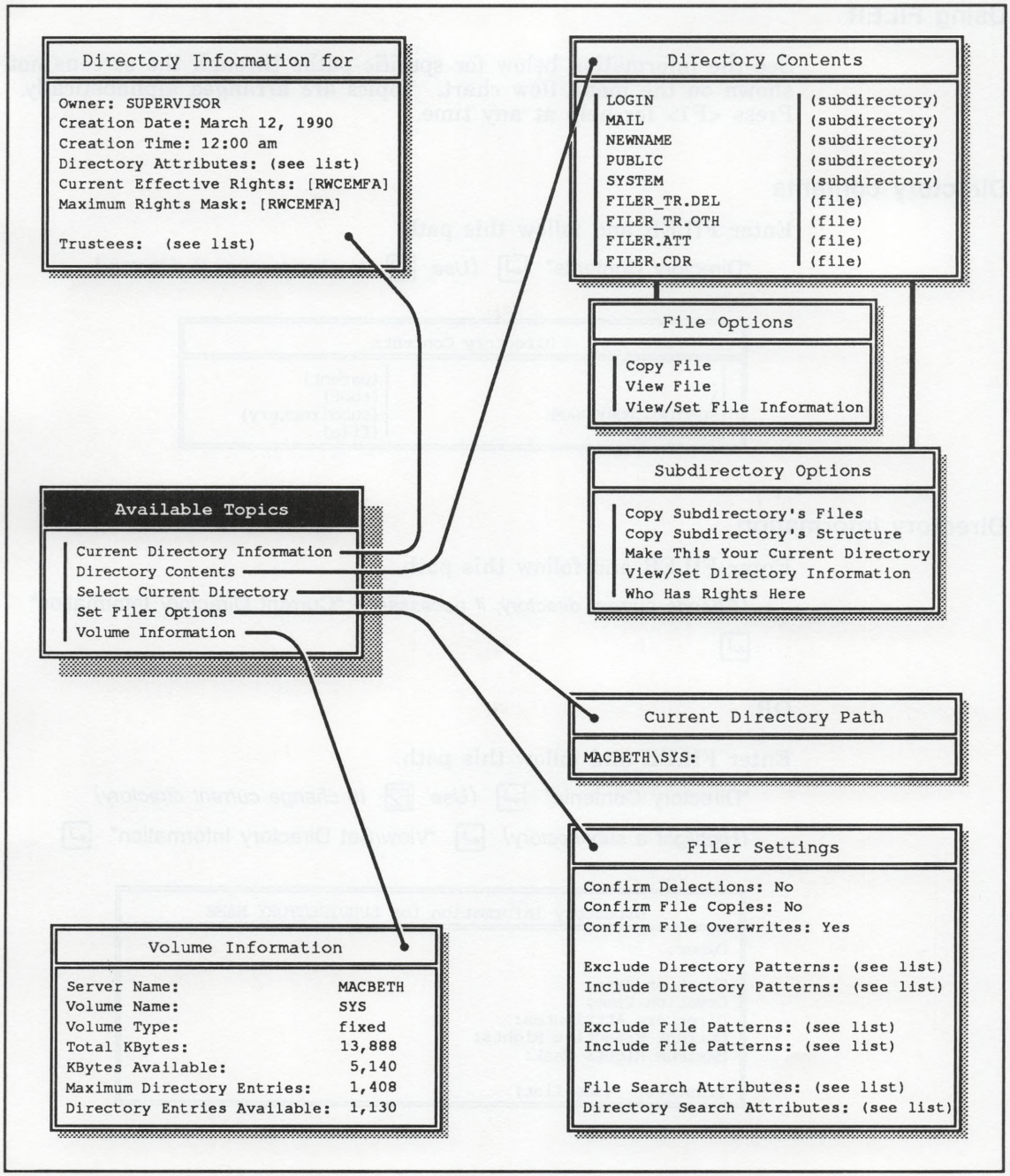
Multiple operations The multiple operations feature saves you time when working with groups of files or subdirectories. Mark a group of files or subdirectories using the <F5>, or <F6> and <F8> keys, then press <Enter>. See "Multiple file operations" and "Multiple subdirectory operations" on page 329.

Customization The customization feature allows you to specify the way the current session of FILER runs. Choosing "Set FILER Options" in the first menu lets you:

- Set FILER's responses during file deletions, copies, and overwrites of multiple files.
- Exclude files and subdirectories from lists.
- Choose to list hidden files or subdirectories where you have sufficient rights.

FILER menu flow

The figure on the next page illustrates the "Available Topics" menu and the submenus that are accessible from each option. The paths to many of FILER's menus are apparent in this illustration.



FILER Overview

Using FILER

See the information below for specific paths through the screens not shown on the menu flow chart. Topics are arranged alphabetically. Press <F1> for help at any time.

Directory contents

Enter FILER and follow this path.

"Directory Contents" ↵ *(Use F2 to change current directory)*

```
Directory Contents

..                          (parent)
\                           (root)
SUBDIRECTORY_NAME           (subdirectory)
FILE_NAME                   (file)
```

Directory information

Enter FILER and follow this path.

(Change current directory, if necessary) "Current Directory Information" ↵

OR

Enter FILER and follow this path.

"Directory Contents" ↵ *(Use F2 to change current directory)*

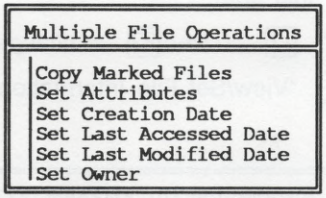
(Highlight a subdirectory) ↵ "View/Set Directory Information" ↵

```
Directory Information for SUBDIRECTORY_NAME

Owner:

Creation Date:
Creation Time:
Directory Attributes:
Current Effective Rights:
Maximum Rights Mask:

Trustees:  (see list)
```

Multiple file operations

Enter FILER and follow this path.

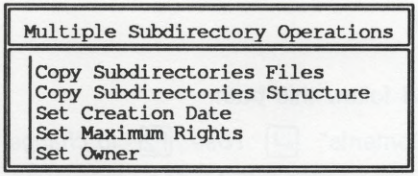
"Directory Contents" ↵ *(Use* F2 *to change current directory) (Mark multiple files using* ↓ ↑ F5 *)* ↵



Multiple subdirectory operations

Enter FILER and follow this path.

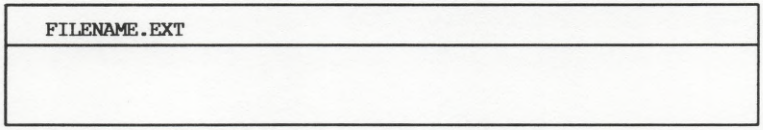
"Directory Contents" ↵ *(Use* F2 *to change current directory) (Mark multiple subdirectories using* ↓ ↑ F5 *)* ↵



View file content

Enter FILER and follow this path.

"Directory Contents" ↵ *(Use* F2 *to change current directory) (Highlight a file)* ↵ "View File" ↵

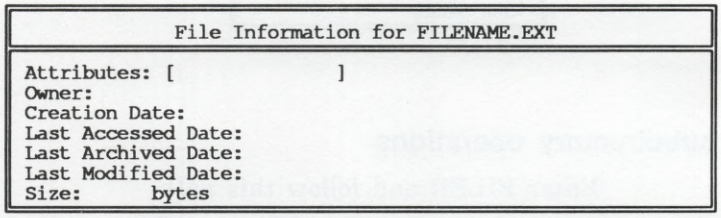


View or change file information

Enter FILER and follow this path.

"Directory Contents" ↵ *(Use F2 to change current directory)*

(Highlight a file) ↵ "View/Set File Information" ↵

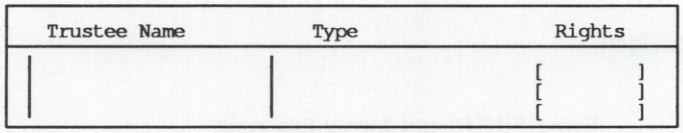


Who has rights in a directory

Enter FILER and follow this path.

"Directory Contents" ↵ *(Use F2 to change current directory)*

(Highlight a subdirectory) ↵ "Who Has Rights Here?" ↵



FLAG

Use FLAG to change the attributes of a file.

Command format

FLAG [path|filename [option ...]]

Using FLAG

- FLAG is placed in SYS:PUBLIC during installation.
- Use the chart on the following page to choose from available file attributes and their command line options.

Note: To use FLAG to change file attributes, your effective rights in the file's directory must include Read, File Scan, and Modify. See also **Security** in *Concepts*.

- FLAG supports wildcard characters and multiple attributes. For example, FLAG *.* displays attributes for all files. FLAG *.BAT SRO flags all batch files SRO.
- Use the constants + or – to add or delete file attributes with any of the options except [N]ormal, [ALL], and [SUB]directory. For example, suppose you flagged your report file with all attributes and now want to delete the Hidden and System attributes. Type

  FLAG REPORT –HSy <Enter>

  When adding and deleting attributes in the same command, all the add (+) attributes must be grouped together, and all the delete (–) attributes must be grouped together.
- Use the task list in this manual for information on how to do specific tasks with the FLAG command.

Related commands

FILER (Directory Contents)
FLAGDIR
GRANT
NDIR
RIGHTS

Option	Attributes	Description
A		Assigns all attributes.
HELP		Displays the command format and available attributes.
H	Hidden	Hides files from DOS DIR scans and prevents them from being deleted or copied. Files will appear in NetWare NDIR scans if a user has the File Scan right.
I	Indexed	Allows large files to be accessed quickly. Is useful for files 256K (262,144 bytes) or larger. To improve performance, only the maximum number of indexed files you designate at installation can actually use the turbo FAT indexes.
N	Normal	Flags files Read Write and removes all other attributes.
Ra	Read audit	Not currently used by NetWare. Can be set, but has no effect.
Ro/Rw	Read only/ Read write	Indicates whether a file can be modified. All files are automatically flagged Read Write when they are created and can be modified unless the Read Only attribute is set. Modify right required to remove the Ro attribute.
S	Shareable	Allows several users to access a file simultaneously. Usually used in combination with the Read Only attribute.
SUB		Flags files in subdirectory.
Sy	System	Assign to system files and their directories. Hides these directories and files from DOS DIR scans and prevents them from being deleted or copied. Files will appear in NetWare NDIR scans if a user has the File Scan right.
T	Transactional	Activates the Transaction Tracking System (TTS). Prevents data corruption by ensuring all changes are made to files being modified or none are. Especially helpful for database files.
Wa	Write Audit	Not currently used by NetWare. Can be set, but has no effect.

FLAGDIR

Use FLAGDIR to view or change directory or volume attributes.

Command format

FLAGDIR [volumename|path [option ...]]

Using FLAGDIR

- FLAGDIR is placed in SYS:PUBLIC during installation.
- Use the following chart to choose from FLAGDIR's available options.

Option	Description
Normal	Set this attribute to clear other attributes for this directory.
HELP	Displays the FLAGDIR command format and the available attributes.
Hidden	Hides directories from DOS DIR scans and prevents them from being deleted or copied. Directories will appear in NetWare NDIR scans if a user has the File Scan right.
SYstem	Hides the directory from DOS DIR scans. Directory cannot be deleted or copied.
PRivate	Allows users to see the directory but not the contents of the directory without File Scan rights. Users can still change to the directory or its subdirectories if they know the correct path; corresponds to the private (gray) folder in the Macintosh environment.

- FLAGDIR requires the Modify right (see **Security** in *Concepts*).
- Use the task list in this manual for information on how to do specific tasks with the FLAGDIR command.
- Use wildcard characters and + or – constants to add or delete multiple attributes.

Related commands

FILER (Directory Contents)
FLAG
GRANT
RIGHTS

GRANT

Use GRANT to give users or groups trustee assignments.

Command format

GRANT rightslist ... [path] [TO] [USER|GROUP] name

Using GRANT

- GRANT is placed in SYS:PUBLIC during installation.
- Use the following chart to choose from GRANT's options.

Option	Description
ALL	Grants the specified user all trustee assignments.
N	Revokes all trustee assignments.
Read	Allows users to open and read files.
Write	Allows users to open and write to existing files.
Create	Allows users to create directories and files.
Erase	Allows users to delete a directory, its files, and subdirectories.
Modify	Allows users to change directory and file names and attributes (with File scan), but not their contents.
File scan	Allows users to see files.
Access control	Allows users to change trustee assignments and the Maximum Rights Masks.

- GRANT requires the Access control right (see **Security** in *Concepts.*)
- Use a space to separate options from each other and from the user or group name (replaces "to"). Include GROUP when the group name matches a username (the default).

Related commands

FILER (Current Directory Information)
REMOVE (trustees)
REVOKE (trustee assignments)
RIGHTS
SECURITY
SYSCON (Group Information, User Information)
TLIST

HELP

Use HELP to view on-line information about NetWare utilities, system messages, and concepts. NetWare HELP allows you to search for and retrieve information from information databases, or infobases.

Command format

HELP [utilityname]

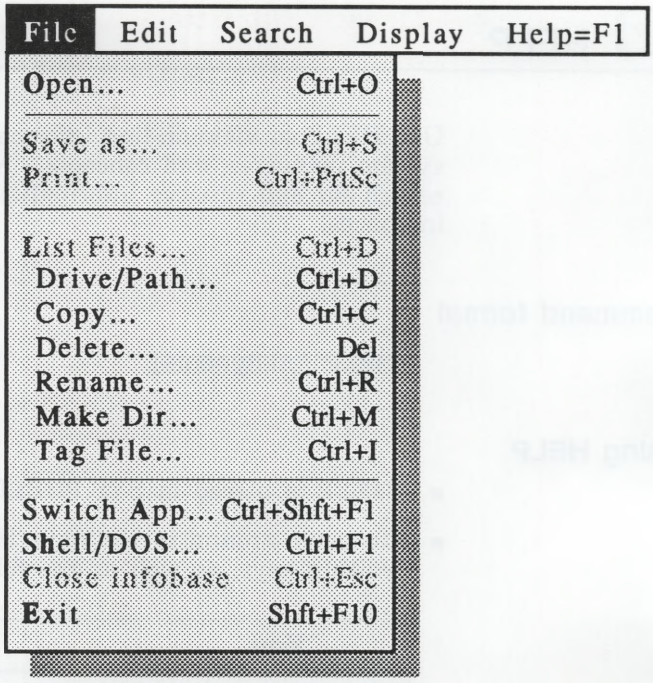
Using HELP

- HELP is placed in SYS:PUBLIC during installation.
- To move around in NetWare HELP, you can use the standard editing keys, as well as the following:

Key	Function
+ or −	Rotates windows without closing them
<Tab>	Moves the cursor to the next link token
<Shift><Tab>	Moves the cursor to the previous link token
<Esc>	Closes windows; exits search

- If your workstation supports graphics, use the Left-Right (↔) Arrow link to access graphics screens, and <Esc> to exit.
- If you have mouse capability, point and click on the menu name.

The following figure displays a sample pull-down menu. These menus replace keystrokes used previously for HELP functions.



If you are using a standard keyboard without mouse support, access the menus with the following keystrokes.

Scanning menus:	<Alt><S> plus Arrow keys
File menu:	<Alt><F>
Display menu:	<Alt><D>

Access information for a specific utility

View information about a specific utility by including the utility name in the command. For example, to view HELP information about LOGIN, type

HELP LOGIN <Enter>

Follow link tokens

Link tokens connect related information from different places in the infobase. Use <Tab> and <Shift><Tab> to position the cursor on the ▼, press <Enter>, and a new window displays the related information. The ↔ links you to a graphics file, software application, or menu utility.

Search for words or phrases

1. With the cursor in a window, but not under a link token, press <Enter> to bring up the complete infobase.

2. Press the spacebar. The search windows appears and the cursor moves to the query window.

3. Type the word(s) or phrase(s) you are searching for. Enclose phrases in quotation marks.

4. Press <Enter>. A new window appears displaying the segments of the infobase where the search words occur. Press <Tab> or <Shift><Tab> to scroll through the segments. To see where the segment appears in the complete infobase, press <Enter> at the segment marker.

5. To exit the search feature, press <Esc>.

Search using operator and wildcard characters

You can perform a variety of searches using NetWare HELP. The following examples illustrate the different types of searches available. Searches can be typed in either uppercase or lowercase.

AND operator. To search for combinations of words, use a space between them to represent the "and" operator. For example, to search for all occurrences of *login* and *script* together in a segment, type

```
LOGIN SCRIPT <Enter>
```

OR operator. To search for occurrences of words either together in the segment or separately, use the slash symbol (/) to represent the "or" operator. For example, to search for all occurrences of the words *login* or *script* or both in the same segment, type

```
LOGIN/SCRIPT <Enter>
```

NOT operator. To search for all occurrences of a word except when it is used with another specific word, use the circumflex symbol (^) to represent the "not" operator. For example, to search for all occurrences of the word *login*, except when it is used with the word *script*, type

```
LOGIN^SCRIPT <Enter>
```

Wildcard characters. Use * and ? to search for variations of words. For example, to search for all words that begin with *logi* followed by one more character, type

LOGI? <Enter>

To search for all words that begin with *log* followed by more than one unspecified character, type

LOG* <Enter>

Proximity search in specified order. To search for words that occur within a certain number of words from each other, type the words inside quotation marks, followed by a number. For example, to search for the words *login* and *script* within five words, type

"LOGIN SCRIPT"5 <Enter>

Proximity search in any order. To search for words that occur within a certain number of words but in any order, type the words inside quotation marks, followed by the "at" symbol (@) and a number. For example, to search for *login* and *script* within two words in any order, type

"LOGIN SCRIPT"@2 <Enter>

Print from HELP

You can block text in NetWare HELP and print it on either an IBM ProPrinter or an HP LaserJet.

1. Press <Ctrl><B> to begin blocking. Use the standard editing keys to block the desired text.
2. Press <Ctrl><PrintScrn> to send the block to a printer.
3. Select "Print."
4. Highlight the desired settings and press <Enter> to print.

To print information on a non-network printer, you can block text from NetWare HELP and save it to a file by highlighting "Redirect Document to _____."

Related commands

NFOLIO

HOLDOFF

Use HOLDOFF to close and allow other users to write to a file you have been working in. This reverses the effect of HOLDON.

Command format

HOLDOFF filename

Using HOLDOFF

- HOLDOFF is placed in SYS:PUBLIC during installation.
- HOLDOFF is never needed unless you use HOLDON first.

Related commands

HOLDON

HOLDON

Use HOLDON to hold open any files you access and to prevent other users from writing to the files you are working in.

Command format

HOLDON filename

Using HOLDON

- HOLDON is placed in SYS:PUBLIC during installation.
- HOLDON does not prevent other users from reading a file.
- Most applications hold accessed files open; if not, HOLDON will hold open any file you access until you use HOLDOFF or reboot your workstation.

Related commands

HOLDOFF

JUMPERS

Use JUMPERS to configure or reconfigure the IPX LAN driver to match either of the following:

- Network board settings in an ISA (standard bus) workstation using dedicated IPX.
- Network board settings in an ISA v2.x file server or other 286-based server or router.

Use JUMPERS only when the options in the driver do not provide the desired combination of supported resource values.

Note: Only drivers specified as "JUMPERS configurable" can be reconfigured. See your Novell authorized reseller for information about "JUMPERS configurable" drivers.

Command format

JUMPERS

JUMPERS overview

When you use JUMPERS to reconfigure LAN drivers, you do not need to regenerate the OS or IPX files. JUMPERS also allows you to use custom options not provided in utilities used to generate OS or IPX files.

Note: Be sure to reconfigure the LAN drivers when you change the network board settings.

If "Packet Size" is included in the list of options for the LAN driver you select in JUMPERS, you can

- Change the workstation packet size specified in the workstation's IPX file of a dedicated DOS IPX workstation.
- Change the server packet size specified in the operating system.

The server packet size specified in the server OS determines the maximum packet size the server will use (the maximum packet size determines the buffer size). However, if the packet size specified in the workstation's IPX LAN driver is smaller than the packet size used by the LAN driver in the OS, the workstation operates with the smaller packet size.

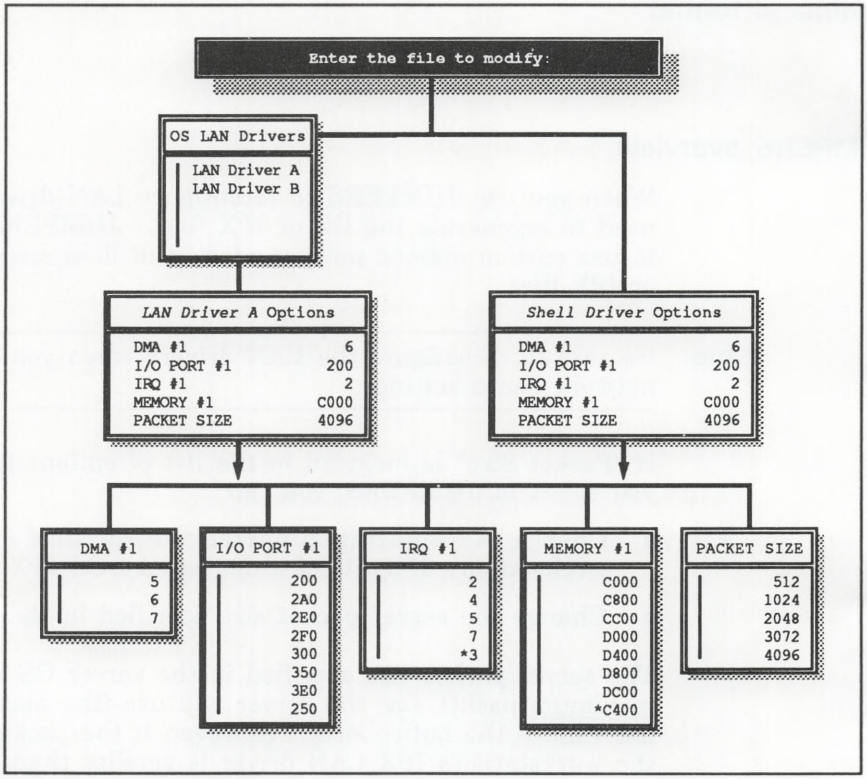
Larger packet sizes in the workstation IPX driver will improve driver throughput, while smaller packet sizes will free up more memory for applications.

If your driver is JUMPERS-configurable, we suggest that you set the workstation packet size to the same size as the server's maximum packet size.

Since JUMPERS is in SYS:PUBLIC, regular users can use it to reconfigure the LAN drivers in their workstation IPX files. However, only SUPERVISOR or Supervisor equivalent can access the LAN drivers in the OS.

JUMPERS menu flow

This figure illustrates the menu flow of the JUMPERS utility. Additional information about menu items is available by pressing <F1> for online help.



JUMPERS Overview

Using JUMPERS

Complete the following steps.

1. At the DOS prompt of the SYS:SYSTEM directory, flag NET$OS.EXE as Normal [N]. You must have SUPERVISOR rights.

2. Run JUMPERS, specifying NET$OS.EXE when prompted for a filename.

3. Select the appropriate LAN driver and change options.

   If you do not have any JUMPERS configurable LAN drivers, you will get an error message.

   A list of options for the LAN driver you select appears with the current or default settings for that driver. (If the driver allows, packet size is one of the parameters.)

   JUMPERS reads all LAN drivers, including drivers that it cannot configure. If another LAN driver in the operating system uses a particular option, that option will appear with an asterisk (*).

   If JUMPERS cannot configure a driver, the driver will not appear on the list, but its current configuration will still be used to check for option conflicts.

Note: JUMPERS does not read configuration options for disk drivers. To avoid conflicts with disk drivers, particularly for DMA or IRQ, you should consult your installation worksheets or run DCONFIG.

---

4. Exit JUMPERS by pressing <Esc>.

5. Flag NET$OS.EXE as Shareable/Read-only [SRO].

6. Enter DOWN to down the server.

If you changed only the packet size, all you need to do is reboot.

If you have a server with microchannel architecture, run REFERENCE (or similarly named program) to change the board settings. Then bring the server up.

If you have an ISA server with an ISA bus, turn off the computer. Change the network board settings. Then bring the server up.

Reconfigure the LAN driver in the workstation IPX file

Note: Some microchannel workstation drivers are self-configuring. In this case, use the REFERENCE (or similarly named) program to change network board settings. Use JUMPERS only if you want to change packet size, and only if the driver supports packet-size changes.

Complete the following steps.

1. At the DOS prompt, run JUMPERS, specifying the IPX file when prompted. For example (depending on the location of the boot files) type

   A:IPX.COM

   or

   C:\IPX.COM

   If you have renamed the IPX file, use the new filename.

2. From the list of "Shell Driver Options," select the options you want to change and change them.

3. To save the changes, press <Esc> and then <Enter> at the main menu.

4. Exit JUMPERS by selecting "Yes" at the confirmation box.

   If you have more than one workstation with the same configuration, copy the modified IPX.COM file (depending on whether your workstations boot from diskettes or hard disks) to either

   - Boot diskettes.
   - A network directory (you can download the file to each workstation's boot diskette or hard disk).

5. Log out.

If you changed only the packet size, all you need to do is reboot.

If you have an ISA server with an ISA bus, turn off the workstation. Change the network board settings. Boot the workstation.

LISTDIR

Use LISTDIR to view subdirectory information, including Maximum Rights Mask, effective rights, creation dates, and subsequent subdirectories.

Command format

LISTDIR [path] [option...]

Using LISTDIR

- LISTDIR is placed in SYS:PUBLIC during installation.
- Use DOS redirection (>) to save the listing to a file.
- Use the following chart to choose from LISTDIR's options.

Option	Description
/Rights	Shows the Maximum Rights Mask of all subdirectories in a directory.
/Effective rights	Shows the effective rights you have in all subdirectories of a directory.
/Date or /Time	Either option shows the creation date of each subdirectory in a directory.
/Subdirectories	Shows the subdirectories of a directory and all subsequent subdirectories.
/All	Shows the Maximum Rights Mask, the effective rights, and the creation date of all subdirectories. Also shows all subsequent subdirectories in the directory.

- Include the forward slash before each option.

Related utilities

FILER
NDIR

LOGIN

Use LOGIN to invoke the applicable login scripts for a user on a particular file server and to access that file server's resources.

Command format

LOGIN [/option...] [fileserver/[name]]

Using LOGIN

- LOGIN is placed in SYS:LOGIN and SYS:PUBLIC during installation.
- Use the following chart to choose from LOGIN's command options.

Command Option	Function
/Script	Overrides the system and user login scripts with a different login script. Include the complete path specification to the login script you want to invoke. Use this option with the /NoAttach option.
/NoAttach	Allows you to invoke a particular login script without logging out of current file servers and attaching to another server. Use this option with the /Script option.
/Clearscreen	Clears your workstation screen as soon as you enter your password.

- LOGIN first logs you out of any file server.
- LOGIN prompts you to change expired passwords and synchronize on any other file server(s) you are attached to with the same password.
- Enter the fileserver name and your username and password at the prompts.
- To log in automatically when you boot your workstation, include LOGIN in your AUTOEXEC.BAT file.
- See "Logging in and out" for more information on login script commands and creating login scripts. See **Login script** in *Concepts* for information on the login process.

Related commands

ATTACH
LOGOUT

LOGOUT

Use LOGOUT to log out of one or more file servers to which you are attached. When you log out of a file server, you terminate your access to that file server.

Command format

LOGOUT [fileserver]

Using LOGOUT

- LOGOUT is placed in SYS:PUBLIC during installation.
- Log out of just one file server you are attached to by specifying the server name after LOGOUT.
- When you log out of a file server, all drive mappings to that file server are deleted.

Related commands

LOGIN
MAP

MAKEUSER

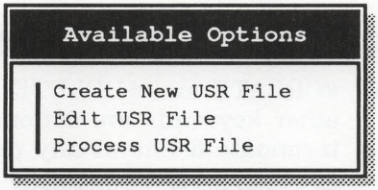
Use MAKEUSER to create and delete users on a regular basis (such as setting up user accounts for employees each month), or to create several users at once.

Command format

MAKEUSER

Using MAKEUSER

- MAKEUSER is placed in SYS:PUBLIC during installation.
- You must have SUPERVISOR or workgroup manager status.
- Creating and deleting users with MAKEUSER involves two main steps: creating a USR file for each user, and processing the USR files. The following menu appears when you enter MAKEUSER.



How to create the USR file

You create the USR file for each user. The file contains the keywords necessary to create and assign rights to new users or to delete existing users. (An explanation of keywords and how to use them follows.)

Create a directory for the USR files you want to create, and enter MAKEUSER from that directory. When you begin to process files, or if you need to modify files or delete files later, you can go to the USR directory and find any file.

Note: You can also use any text editor to create a USR file. Follow the instructions in the text editor documentation for saving an ASCII/DOS file. Be sure to give the file a .USR extension.

Summary of MAKEUSER keywords

The keywords used to create and delete users are listed alphabetically below. Each one will be explained in detail.

#ACCOUNT_EXPIRATION *month day year*
#ACCOUNTING *balance, lowlimit*
#CLEAR or #RESET
#CONNECTIONS *number*
#CREATE *username* [*option...*]
#DELETE *username*
#GROUPS *group*
#HOME_DIRECTORY *path*
#LOGIN_SCRIPT *path*
#MAX_DISK_SPACE *number*
#NO_HOME_DIRECTORY
#PASSWORD_LENGTH *length*
#PASSWORD_PERIOD *days*
#PASSWORD_REQUIRED
#PURGE_USER_DIRECTORY
#REM or REM
#RESTRICTED_TIME *day, start, end*
#STATIONS *network, station*
#UNIQUE_PASSWORD

The following restrictions apply to entering keywords:

- #CREATE and #DELETE must be included in the USR file; all other keywords are optional. #CREATE requires a caret (^) to terminate a line at any point.
- The #CLEAR or #RESET keywords can be used to mark the beginning of a new set of keywords within the same file.
- Each keyword must be on a separate line.
- If the same keyword is specified more than once, only the last value is used; previous values are ignored.
- If not all variables are specified on the line following the keyword, enter a carat (^) at the end of the line.

#ACCOUNT_EXPIRATION month day year

Specify when users' accounts expire. If it is not used, the accounts never expire. Use only with #ACCOUNTING. To have BRAD and HEATHER's accounts expire July 24, 1991, type

```
#account_expiration July 24, 1991
#create brad^
#create heather^
```

#ACCOUNTING balance, lowlimit

Specify the account balance and low balance limit for the users you create. Replace *balance* and *lowlimit* with numeric values based on what you specified when you installed accounting. *Balance* cannot be less than *lowlimit*. To assign BRAD a balance of 1,000 and a lowlimit of -200, and HEATHER a balance of 500 and a low limit of 0, type

```
#accounting 1000, -200
#create brad^
#clear
#accounting 500, 0
#create heather^
```

#CLEAR or #RESET

Use either keyword to start a new set of keywords in the same USR file. All previous keywords encountered in the USR file have no effect on what follows #CLEAR. To add BRAD and HEATHER to the group SALES and assign CHRIS time restrictions without being a member of the group SALES, type

```
#groups sales
#create brad^
#create heather^
#clear
#restricted_time mon, 12:00 p.m., 2:00 p.m.
#create chris^
```

#CONNECTIONS number

Use this keyword to specify the maximum concurrent connections each user can have. If no number is specified, each user can have as many concurrent connections as the file server supports. To allow BRAD and HEATHER to log in from only one workstation at a time, type

```
#connections 1
#create brad^
#create heather^
```

#CREATE username [;fullname] [;password] [;group] [;directory [rights]]

Use this to create users and specify information (separated by semicolons). Include *username*; other variables are optional. When you create a user, a home directory is automatically created in the

SYS volume. For this reason, you cannot use the same username more than once in a USR file.

If you want home directories created in a different location, see #HOME_DIRECTORY. If you do not want to create a home directory, use the #NO_HOME_DIRECTORY flag in the script file to override the automatic creation of a home directory.

Each user is automatically assigned to the group EVERYONE. You can assign users to more than one group by separating group names with a comma. The *fullname* cannot contain commas. If you do not specify rights in a directory, the default rights (R, F) are assigned. If you want to assign all rights, type "All" after the directory. You can assign rights in more than one directory by separating each sequence (*directory, rights*) with a comma.

Note: To extend the information for each keyword to the next line, put "+" after a variable. To specify some but not all, insert a double semicolon (;;) for each missing variable.

To create user NANCY and assign her the full name "Nancy I. Smith;" assign her a password, "knockknock"; make her a member of two groups, CLASS1 and CLASS5; and assign her all trustee rights to directory SYS:READ; create user DANIEL with password "openup;" and create user RACHEL, type

```
#create nancy; Nancy I. Smith; knockknock;+
CLASS1, CLASS5; SYS:READ ALL
#create daniel;;openup^
#create rachel^
```

#DELETE username [;username]

Specify user(s) to delete. You can enter #DELETE in the same file as #CREATE but not delete a username created in the same file unless separated by #CLEAR or #RESET. If you have rights to delete the user's home directory, precede #DELETE with #HOME_DIRECTORY and #PURGE_USER_DIRECTORY. For example, to create ROB and SUSAN with home directories before deleting SALLY and EDMUND and their directories, type

```
#home_directory SYS:HOME
#create rob^
#create susan^
#purge_user_directory
#delete sally; edmund
```

#GROUPS group [;group]

Specify the name of the group you want users assigned to. New users are automatically assigned to the group EVERYONE. Create other groups with SYSCON before including them here. To assign LARRY to groups CLERKS and REVIEW, type

```
#groups CLERKS; REVIEW
#create larry^
```

#HOME_DIRECTORY path

Specify home directory to assign to users with #CREATE and to delete for users with #DELETE. Only existing directories can be specified where you have the Create right. If this keyword is not used before #CREATE, a home directory is automatically created in the SYS volume. To create home directories in SYS:NEWUSERS for ROBIN and GARY and delete DEANNE, STEVE, JARED, and JAN with their home directories, type

```
#home_directory sys:newusers
#create robin^
#create james^
#purge_user_directory
#delete deanne; steve; jared; jan^
```

#NO_HOME_DIRECTORY

Override the creation of a default home directory.

#LOGIN_SCRIPT path

Specify the location of the file containing a login script to be copied and used for new user. MAKEUSER places the file in each user's mail directory. The file containing the login script must already exist (created in SYSCON or with a text editor and put it in a convenient directory). To assign LIZ a login script in EVERYONE.LOG in the SYS:PUBLIC directory, type

```
#login_script sys:public/everyone.log
#create liz^
```

#MAX_DISK_SPACE number

Specify the maximum number of volume space (4KB disk blocks) for each new user. The default is unlimited. Use this keyword only if the volume limitation option was set with DSPACE. To assign

user JUDY a maximum disk space of 4 megabytes (4,096KB) on volume SYS, type

```
#max_disk_space SYS, 4096
#create judy^
```

#PASSWORD_LENGTH length

Specify the minimum length (between 1 and 20) of the new users' passwords. The default is five characters. Enter PASSWORD_REQUIRED before PASSWORD_LENGTH. To require user MIKE to have a password of at least seven characters, type

```
#password_required
#password_length 7
#create mike^
```

#PASSWORD_PERIOD days

Specify the number of days (between 1 and 365) before password expiration. If this keyword is not used, the password never expires. Enter PASSWORD_REQUIRED before PASSWORD_PERIOD. To require user DOUG to change his password every 30 days, type

```
#password_required
#password_period 30
#create doug^
```

#PASSWORD_REQUIRED

Require users to have a password. If this keyword is not specified, users can decide whether to use a password. Enter PASSWORD_REQUIRED before PASSWORD_LENGTH, UNIQUE_PASSWORD, or PASSWORD_PERIOD. To require user BECKY to have a password, type

```
#password_required
#create becky;;becky^
```

#PURGE_USER_DIRECTORY

Delete any subdirectories owned by the user when the user is deleted. Use also in conjunction with the HOME_DIRECTORY keyword to delete the user's home directory. Enter this keyword before #DELETE. If you want to delete the user's home directory, include #HOME_DIRECTORY.

To delete user RANDY, his home directory in the SYS:HOME directory, and any subdirectories he may have created, type

```
#home_directory SYS:HOME
#purge_user_directory
#delete randy^
```

#REM

Make comments about the information in your USR file. #REM must appear as the first word on the line. The rest of the line is ignored when the file is processed. To identify the contents of a USR file, you may want to include #REM.

```
#rem Students in English 302, winter semester '91
#create willie^
#create john^
#create jane^
#create bob^
```

#RESTRICTED_TIME day, start, end [;day, start, end]

Specify which days and hours new users cannot log in to the file server. If this keyword is not used, no restrictions apply. The *end* time cannot be earlier than the *start* time. To prevent user JOYCE from logging in Monday between 7:00 a.m. and 8:00 a.m. and DEVIN from logging in daily during lunch, type

```
#restricted_time mon, 7:00 a.m., 8:00 a.m.
#create joyce^
#restricted_time everyday, 12:00 p.m., 1:00 p.m.
#create devin^
```

#STATIONS network, station [;station] [;network, station]

Specify the physical workstations from which users can log in to the file server. If this keyword is not used, users can log in from any workstation. Use the hexadecimal network and station addresses (no more than 8 and 12 digits, respectively). If all stations are to be included for a given network, replace the station address with "all." To allow user MALIA to log in only from stations FD and 00001B02745E on network 1234 and users VERN and TOM no access on network BADFACE5, type

```
#stations 1234, FD, 00001B02745E
#create malia^
#stations BADFACE5, all
#create vern
#create tom
```

#UNIQUE_PASSWORD

Prevent users from reusing any of their previous ten passwords when they change their passwords. If this keyword is not specified, users can choose passwords they used previously. Enter PASSWORD_REQUIRED before UNIQUE_PASSWORD. To require user MARJ a unique password every 30 days, type

```
#password_required
#password_period 30
#unique_password
#create marj^
```

How to edit a USR file

The MAKEUSER menu utility lets you edit a USR file. Only SYSCON can change an account for a user already on the network.

Move to the directory that contains the USR file you want to edit, enter MAKEUSER, and select "Edit USR File" from the "Available Options" menu. Either type the name of the USR file or press <Insert> to see a list of USR files you can select from. After making changes, press <Escape> to exit.

How to process a file with MAKEUSER

Move to the directory that contains the USR file you want to process, enter MAKEUSER, and select "Process USR File" from the "Available Options" menu. Either type the name of the USR file or press <Insert> to see a list of USR files you can select from.

MAKEUSER first scans the USR file for any syntax errors. Warnings or error messages similar to following may appear:

```
Keyword expected
Specification exceeded the limit, the rest of the line ignored
Username CHUCK already specified
```

Errors must be corrected before the file can be processed. See "How to edit a USR file" above.

Once scanned successfully, the file is processed. Logic errors are placed in a report (RPT) file, along with the results of processing the USR file. You should always check the RPT file to see if your USR file has been processed successfully. To do this, exit MAKEUSER and use DOS TYPE on name of the USR file with a .RPT extension that you have just processed. Edit the USR file and process it again as necessary.

MAP

Use MAP to view or change your current drive mappings.

Command formats

MAP [option] [drive: = drive:|path]

Using MAP

- MAP is placed in SYS:PUBLIC during installation.
- The following chart explains MAP's command options.

Option	Description
INSert	Use this option to insert a search drive mapping without replacing an existing mapping.
DELete	Use this option to delete a default, network, or search drive mapping.
ROOT	Use this option to map a drive to a fake root directory. (Some applications require rights in the root directory-NetWare allows sufficient rights in a subdirectory that acts like the root without losing security by giving users too many rights at the root.)
REMove	Use this option to delete a default, network, or search drive mapping.
Next	Use this option to map the next available drive to a specified path.

- Drive mappings are deleted when you log out of the file server or reboot your workstation. If placed in your login script, network drive mappings (even over local drives) execute each time you log in. See **Login script** in *Concepts* and "Logging in and out" for more information.
- Use S and a number to create a search drive mapping (S3:=). The first search drive is assigned drive letter Z, the second Y, the third X, and so on. You may have up to 16 search drives and 26 (including local drives) total mappings.

Related commands

LOGIN
SESSION (Drive Mappings, Search Mappings)

MENU

Use MENU to access customized menus you create. You can create your own menus in any text editor that is capable of saving a file in ASCII format. Using the text editor, specify the applications and programs you want to use. Then you use MENU to run the menu you have created.

Command format

MENU [path] filename

Using MENU

- MENU is placed in SYS:PUBLIC during installation.
- Use MENU to run a menu you create (with a text editor capable of saving it in ASCII format) that specifies applications and programs that you want to use. This menu centralizes and speeds access to the tasks or tools you handle daily. When MENU runs the menu you create, it will look and respond like all NetWare menu utilities.
- Information on how to plan and create menus that you access with MENU is found in "Customizing menus."
- If the filename of the menu you specify in the MENU command includes the default .MNU extension, you do not need to type the extension when you type the filename. Include any other extension as part of the filename.
- When you exit an application or program accessed through the menu, the menu reappears.
- To access an application or program that is not an option on the menu you are using, exit by pressing <Esc> and answering "Yes" at the prompt. Edit the ASCII menu file to include the application or program for future access.
- If a specified application or program on your menu is not available on your system, MENU searches for it and returns you to the menu screen after not finding it.

Related commands

COLORPAL

MONITOR

Use MONITOR to track the activities of all workstations that are logged in or attached to the file server.

Command format

MONITOR [station number]

Using MONITOR

- MONITOR is coded into the file server operating system and ROUTER.EXE.
- Include a station number if you want to monitor the activities of a specific workstation. This number may be obtained with FCONSOLE.
- MONITOR allows you to see files that stations are using and possibly locking.
- The screen displays information on six stations at once (stations 1 through 6, 7 through 12, and so on). The request area to the right of each station number indicates the most recent file server request the workstation made.
- MONITOR also displays the operating system version, the percentage of file server utilization (updated every second), and the number of cache buffers that have been changed in the file server's memory that are disk I/O pending (have not yet been written to disk).
- When a workstation requests a transaction, MONITOR displays up to five files and a file status message. Every file has an accompanying DOS task number to the left of the status field. NetWare allows file-sharing protocol level three (transactions).

  P (first column) indicates other stations cannot read the file.

  R (second column) indicates the file is open to read by the station.

  P (third column) indicates other stations cannot write to the file.

  W (fourth column) indicates the file is open to write by the station.

File status may also have one of the following identifiers:

Pers indicates the file is logged but not locked.

Lock indicates the file is locked.

A file server running dedicated NetWare operating system may also display these two status letters:

T (first column) indicates that a file that is flagged as transactional is open.

H (second column) indicates that a transactional file is on hold until the transaction is completed.

- Following is a list of the messages that you may see displayed in the request area:

Alloc Resource Record	Log Record
Begin Trans File	Open File
Clear File	Pass File
Clear File Set	Read File
Clear Record Set	Rel Phy Rec
Close File	Rel Phy Rec Set
Clr Phy Rec	Rel Record Set
Clr Phy Rec Set	Rel Resource
Copy File	Release File
Create File	Release File Set
Dir Search	Release Record
End of Job	Rename File
End Trans	Search Next
Erase File	Semaphore
Floppy Config	Set File Atts
Get File Size	Start Search
Lock File	Sys Log
Lock Phy Rec Set	Unlock Record
Lock Record	Win Format
Log Out	Win Read
Log Pers File	Win Write
Log Phy Rec	Write File

- Run MONITOR again if you suspect an application has "crashed" (perhaps the display shows W for 20 minutes).

Related commands

OFF

MOUNT

Use MOUNT to make a removable volume available to your users. You can mount and dismount one or more removable volumes while the file server is running.

Command format

MOUNT volume_number

Using MOUNT

- MOUNT is coded into the file server operating system.
- You must create a volume using INSTALL before you can mount it. See *Installing and Maintaining the Network* for more information on creating volumes.

Related commands

DISMOUNT

NAME

Use NAME to display the name of the file server.

Command format

NAME

Using NAME

- NAME is coded into the file server operating system.
- Use an underscore (_) to represent a space in the name, as a space is not a valid character.
- File server names may range from 2 to 45 characters.

Related commands

ATTACH
LOGIN
LOGOUT

NBACKUP

Use NBACKUP to back up and restore data on file servers and local drives.

Command format

NBACKUP

After you enter the command, you see a menu with options you can select for performing your task.

NBACKUP software

NBACKUP files should have been loaded by the installation program; if they were not, you will need to load them before you can run the utility. These files are found on the *BACKUP* diskette, and should be loaded into the SYS:PUBLIC directory. You will need the following files:

- Core utility files: NBACKUP.EXE, NBACKUP.COM, NBACKUP.HLP, and NBACKUP.OVL. The following files are also required for using NBACKUP with Wangtek: SELDIBI.OVL, SELDIBI.HLP, and WANGTEK.EXE.
- Files associated with non-DOS backup devices: the data file containing non-DOS driver names (DIBI$DRV.DAT), and the actual non-DOS driver files (*DRIVER*.EXE).

  Information about the DIBI$DRV.DAT file and adding non-DOS drivers is found in the "Backup media" on the following page.

Rules for using NBACKUP

To save time and avoid errors when backing up or restoring data, familiarize yourself with these rules. See also **Backup** in *Concepts*.

- You must run NBACKUP from a workstation on your network. The workstation remains dedicated to backing up until the backup is complete unless you interrupt the session using <Escape>.
- You must restore to the system type you backed up from. For example, if you back up a local drive, you must restore to a local drive; if you back up a NetWare v2.*xx* system, you must restore to a NetWare 2.*xx* system; and so on.

- To back up data you need Read and File Scan rights in the directory to be backed up. To restore data you need Create, Erase, File Scan, Modify and Write rights in the destination directory.

  The option to back up the entire file server appears only for supervisor-equivalent users.

- Use the backup media as explained below.

Backup media

DOS devices. Because the backup and restore processes write, read, and rewrite some of the data, the media must be able to update or change information already on the media. The following types of devices can be used.

- Workstation floppy drives
- Tape drives that have a DOS device driver
- Optical drives that have a DOS device driver and are read-write devices
- Workstation hard disks
- Network drives
- An optical disk for a WORM drive that has a DOS device driver

If the data you are backing up won't fit on one DOS device (for example one local hard drive), you must divide the backup job into multiple sessions.

If you are using a specific DOS device (a Wangtek tape drive, for example), keep in mind that the tape rewinds when you start a new session. Data already existing on the cartridge will be overwritten.

If you back up to DOS devices only, you should remove the DIBI$DRV.DAT file which is initially installed in SYS:PUBLIC. You can also remove the driver files referenced in the file. Then you will not have to select the device method each time you enter NBACKUP.

Non-DOS devices. Current drivers for non-DOS devices are listed in the first menu displayed when you run NBACKUP. Selecting the device from the list links the driver (an .EXE file in SYS:PUBLIC) with NBACKUP.

Manufacturers of additional devices may include their own installation instructions with the drivers. If so, follow those instructions. Otherwise, complete the following to install a non-DOS device.

1. Place the diskette containing the new driver in drive A and type the following.

   NCOPY A:DRIVER.EXE SYS:PUBLIC <Enter>

2. Using a text editor, modify the DIBI$DRV.DAT file to include a line for the new driver. For example, type

   "Text to appear in the driver list" driver

The text inside the quotation marks indicates the text string that is displayed in the opening menu. DRIVER specifies the device driver to execute when that particular option is selected.

Using these instructions, you can install as many drivers as you need. You can then install the hardware for the workstation according to the manufacturer's instructions.

- Use DOS and Mac filename formats. Macintosh file or directory names prefix the name with a colon (:), even after the conventional colon following a volume name. For example, volume SYS may have a directory MacBeth with a file called MacDuff. To specify MacDuff, you would type

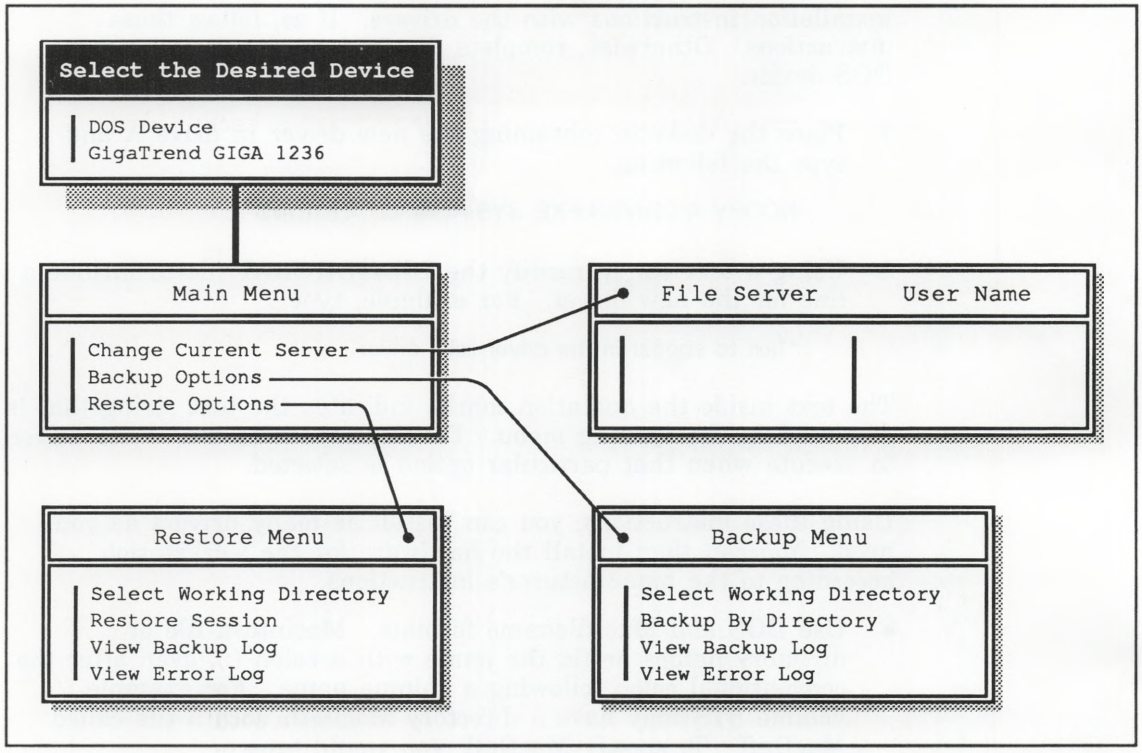
  SYS::MacBeth:MacDuff

  Remember that Macintosh file and directory names are case sensitive whereas DOS names are not.

- If you have hidden or system directories, you must change the directory attributes to make the directories visible before you can back them up.

NBACKUP menu flow

The following illustration presents an overview of how the program menus fit together within NBACKUP.



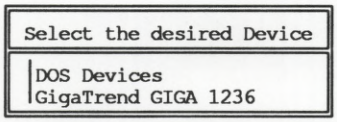
Starting NBACKUP

To run NBACKUP, you must first select a backup device. Then you must select the file server you want to back up as the current server. You must also specify a working directory before you can work with backup or restore options.

Select a backup device

Access the following screen by entering NBACKUP and typing

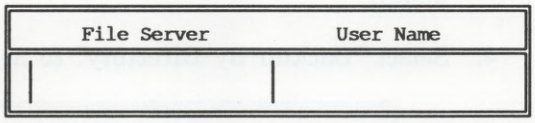
NBACKUP <Enter>



After you select a backup device the Main Menu appears.

Select current file server

Access the following screen by selecting "Change Current Server." (This assumes you have selected a backup device.)



After you select a current server you are returned to the Main Menu.

The working directory

The working directory stores two session files: one contains a backup log and other contains an error log for each backup and restore session.

- A backup log (*BACK*$LOG.*xxx*)
- An error log (*BACK*$ERR.*xxx*)

The working directory must be located on a local hard drive, a network drive, or the storage media you are working with. Once specified, the working directory remains for all backup and restore sessions until you leave NBACKUP.

If these session files are ever lost (deleted) and if your session files were generated with NBACKUP version 1.1 or above, you can restore them from the storage media and recover your data. If they were generated with older versions, you can rebuild them. See the instructions under "Restoring session files" on page 375.

Backup by directory

Use this option to back up the complete directory structure, or any of its components. Be sure the backup medium you are using will accommodate all data in the directory. Otherwise, you must divide the backup into smaller sessions.

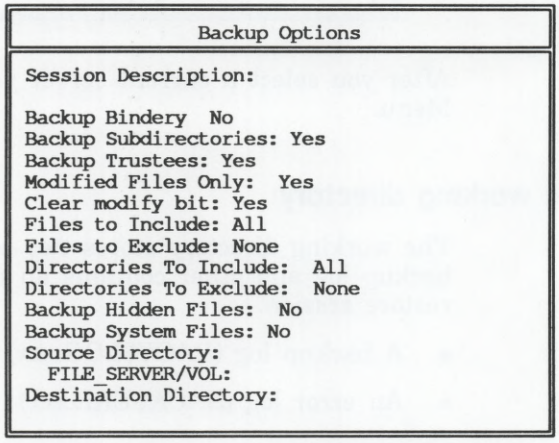
1. To start NBACKUP type

   NBACKUP <Enter>

2. Select "Backup Options," then select "Select Working Directory."

3. Select the working directory. You can press <Insert> to select a directory path from lists of directories. After selecting a directory you are returned to the "Backup Menu."

4. Select "Backup By Directory" to access the following menu.



   If you chose a non-DOS device, the "Destination Directory:" is already chosen and the option does not appear.

5. Specify the options you want, press <Escape>, and confirm your selections. The "Start Backup Menu" appears.

6. To begin the backup now, select "Start Backup Now."

   To specify a later time to begin the backup, select "Start Backup Later." Enter the date and time to start the backup. The backup session screen windows appear.

The station is dedicated to running NBACKUP until the session is complete.

Backup current file server

Use this option to back up entire file servers or selected components. Be sure your backup medium will accommodate all file server data. If it won't, divide the backup into multiple sessions and use the "Backup By Directory" option.

This option appears only if you are logged into the current server as SUPERVISOR or an equivalent.

1. To start NBACKUP type

   NBACKUP <Enter>

2. Select "Backup Options," then select "Select Working Directory."

3. Select the working directory. You can press <Insert> to select a directory path from lists of directories. After selecting a directory you are returned to the "Backup Menu."

4. Select "Backup File Server" to access the following menu.

```
Backup Options

Session Description:

Backup Bindery  Yes
Backup Trustees: Yes
Modified Files Only:  Yes
Clear modify bit: Yes
Files to Include: All
Files to Exclude: None
Directories To Exclude:  None
Backup Hidden Files:  No
Backup System Files: No
Destination Directory:
```

   If you chose a non-DOS device, the "Destination Directory:" is already chosen and the option does not appear.

5. Specify the options you want, press <Escape>, and confirm your selections. The "Start Backup Menu" appears.

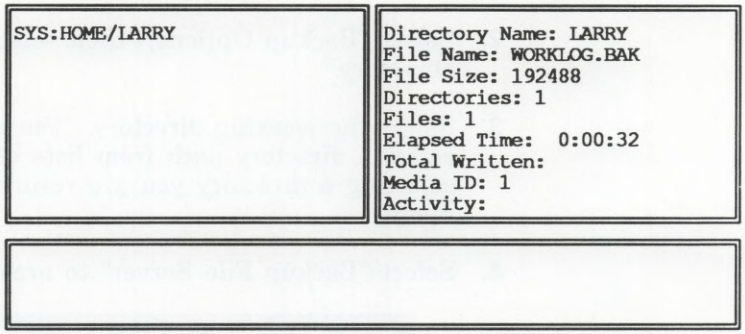
6. To begin the backup now, select "Start Backup Now."

   To specify a later time to begin the backup, select "Start Backup Later." Enter the date and time to start the backup. The backup session screen windows appear.

The station is dedicated to running NBACKUP until the session is complete.

Monitor a backup session

After you begin a backup session, status windows similar to the following appear. No on-line help is available for the status windows.



The status windows report what is happening during the session. The upper-left window displays the information being written to the backup log, including what data is currently being backed up. The bottom window displays information being written to the session error log. Fields in the upper-right window indicate the following:

- Directory Name: name of the directory being backed up.
- File Name: name of the file being backed up.
- File Size: byte size of file being backed up.
- Directories: number of directories backed up in session so far.
- Files: number of files backed up in session so far.
- Elapsed Time: hours, minutes, seconds session has been running.
- Total Written: total bytes written to backup medium so far.
- Media ID: number assigned to tape or cartridge currently in use. (Each new tape is given an incremented number. Label the cartridges as you insert them.)
- Activity: shows that the backup is still in process.

When a time-delayed backup ends, you are prompted for passwords to all attached file servers. If correct passwords are not supplied within 30 minutes, you are logged out.

Restore backed-up information

1. To start NBACKUP type

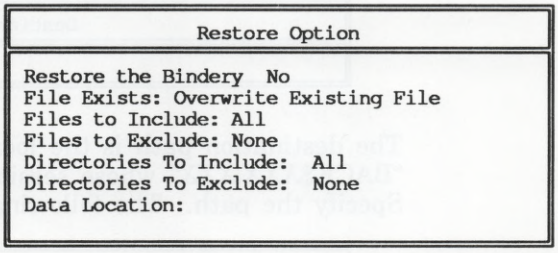
   NBACKUP <Enter>

2. Select "Restore Options," then select "Select Working Directory."

3. Select the working directory that was specified during the backup session. After selecting a directory you are returned to the "Restore Menu."

4. Select "Restore Session." The "Restore Session" screen appears.

5. Select the session you want to restore. The following screen appears.



   If the session you want doesn't appear, press <Insert> and enter the path location of the session you want to restore. If the session files cannot be found or were deleted, see "Restoring session files" below.

6. Specify the options you want, press <Escape>, and confirm your selections.

Restoring session files

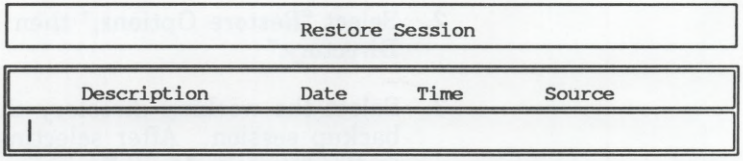
If session files are ever lost (deleted) and if your session files were generated with NBACKUP version 1.1 or above, you can restore the session files from the storage media and recover your data. If they were generated with older versions, you can rebuild them. Complete the following instructions to recover the backup session files.

1. To start NBACKUP type

   NBACKUP <Enter>

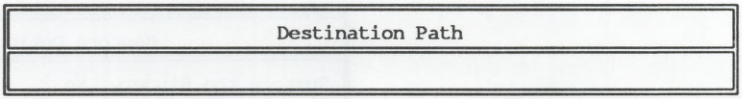
2. Select "Restore Options," then select "Restore Session."

   Session descriptions appear for any files in the working directory specified during the backup session.

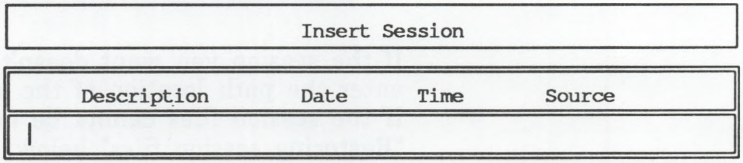


3. Select the backup session you want to restore, then return to the section that referred you here.

   If the session you want doesn't appear, press <Insert>. The following screen appears.



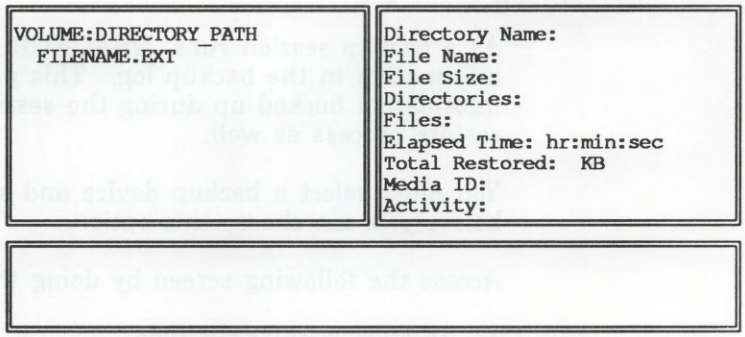
   The destination path is the location of the backup file "BACK$*XXX.XXX*" whose session files you want to recover. Specify the path. The following windows appear.



4. Select the session you want. Session files for the session selected are recovered to in the current work directory.

Monitor a restore session

After you begin a backup session, status windows similar to the following appear. No on-line help is available for the status windows.



The status windows report what is happening during the session. The upper-left window displays the information being read from the backup log. The bottom window displays information being written to the session error log. Fields in the upper-right window indicate the following:

Directory Name	Name of the directory being restored
File Name	Name of the file being restored
File Size	Byte size of file being restored
Directories	Number of directories restored in session so far
Files	Number of files restored in session so far
Elapsed Time	Hours, minutes, seconds session has been running
Total Written	Total bytes restored so far
Media ID	Number assigned to tape or cartridge currently in use
Activity	Shows that the restore is still in process

If you receive error messages during the restore session, they are added to the existing error log. See "View the error log for a given session" on the next page.

View the backup log for a given session

As a backup session runs, NBACKUP records certain information in the backup log. This provides a record of information backed up during the session, and directs the restore process as well.

You must select a backup device and specify a work directory before you can choose this option.

Access the following screen by doing the following:

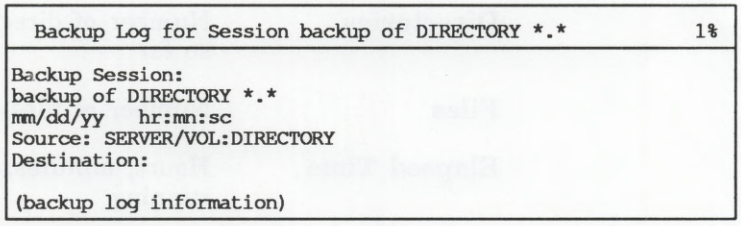
1. To start NBACKUP type

   NBACKUP <Enter>

2. Select "Backup Options," then select "View Backup Log," then select a session backup log you want to view; or

   Select "Restore Options," then select "View Backup Log," then select a session backup log you want to view.

If the session you want doesn't appear in the list and the working directory is correct, follow the instructions under "Restoring session files" on page 375.



Information displayed is found in the BACK$LOG.XXX file found in the work directory specified. The three-digit "Backup Session" number corresponds with the three digits in the file extension. You can print this file as you would any ASCII text file.

View the error log for a given session

As a backup session runs, NBACKUP records error messages in the error log. Additional messages are recorded during the restore session. Some error messages are informational and some indicate that you need to repeat the backup session.

You must select a backup device and specify a work directory before you can choose this option.

Access the following screen by doing the following:

1. To start NBACKUP type

   NBACKUP <Enter>

2. Select "Backup Options," then select "View Backup Log," then select a session backup log you want to view; or

   Select "Restore Options," then select "View Backup Log," then select a session backup log you want to view.

If the session you want doesn't appear in the list and the working directory is correct, follow the instructions under "Restoring session files" on page 375.

```
Error Log for Session NAME                                    100%

Backup Session: XXX Errors
SESSION NAME
mm/dd/yy  hr:min:sec
Source: FILESERVER/VOL:DIRECTORY_PATH
Destination:

mm/dd/yy  hr:min:sec  ERROR MESSAGE
```

Information displayed is found in the BACK$ERR.XXX file found in the work directory specified. The three-digit "Backup Session" number corresponds with the three digits in the file extension. You can print this file as you would any ASCII text file.

NCOPY

Use NCOPY to copy one or more files from one network directory to another.

Command format

NCOPY [path|drive:]filename [to] path|drive:filename [option...]

Using NCOPY

- NCOPY is placed in SYS:PUBLIC during installation.
- The following chart explains NCOPY's options.

Option	Description
/A	Copies only those files which have the archive bit set, without resetting the archive bit.
/Copy	Copies files without preserving the attributes and name space information.
/Empty subdirectories	Copies the empty subdirectories when you copy an entire directory with the /S option.
/Force sparse files	Forces the operating system to write sparse files.
/Inform	Notifies when attributes or name space information cannot be copied.
/M	Copies only those files which have the archive bit set, and resets the archive bit after copying.
/Preserve	Copies system and hidden files and preserves their attributes.
/Subdirectories	Copies subdirectories (in addition to files) when you copy an entire directory.
/Verify	Verifies that the original file and the copy are identical.

- Leave a space between the source filename and destination directory path, or between the drive letter and the destination. NCOPY supports wildcard characters and up to 25 directory levels. Copies retain the original's date and time modified.
- NCOPY automatically preserves a file's existing attributes. Name space, long name, extended attribute, and Macintosh files' resource fork support depend on the NetWare version.

Related commands

FILER (Directory Contents)
FLAG

NDIR

Use NDIR to view and sort a directory's files and subdirectories by the following information:

- Name
- File size
- Date and time
- Date last accessed
- Files that need to be archived
- Date last archived
- Date created
- File attributes
- File owner
- Macintosh files
- Subdirectory rights information

Command format

NDIR [path] [/option ...]

Using NDIR

- NDIR is placed in SYS:PUBLIC during installation.
- The chart on the following page explains NDIR's options.
- Use NDIR to sort files and subdirectories by the categories at the left. Precede all options with a forward slash (/). Include spaces and only the bold, uppercase letters shown on the chart.
- REVERSE allows you to sort file and subdirectory information in reverse order. NOT allows you to view all files that do not match the attribute you indicate.

Related commands

FILER (Directory Contents)
FLAG
GRANT

	Option	Description
Attribute	**[NOT] Archive needed**	Displays directory files flagged Archive needed.
	[NOT] EXecute	Displays directory files flagged Execute Only.
	[NOT] Hidden	Displays directory files flagged Hidden.
	[NOT] Indexed	Displays directory files flagged Indexed.
	[NOT] Read Audit	Displays directory files flagged Read Audit.
	[NOT] Read Only	Displays directory files flagged Read Only.
	[NOT] Shareable	Displays directory files flagged Shareable.
	[NOT] SYstem	Displays directory files flagged System.
	[NOT] Transactional	Displays directory files flagged Transactional.
	[NOT] Write Audit	Displays directory files flagged Write Audit.
Date	**ACCESS [NOT] BEFore|EQual|AFTer** *mm-dd-yy*	Displays directory files last accessed before, on, or after the date you specify.
	ARCHIVE [NOT] BEFore|EQual|AFTer *mm-dd-yy*	Displays directory files archived before, on, or after the date you specify.
	CReate [NOT] BEFore|EQual|AFTer *mm-dd-yy*	Displays directory files created before, on, or after the date you specify.
	DATES	Allows you to view time and date information about files. Shows the last modified, last archived, last accessed, and created dates for directory files.
	[REVerse] SORT ACcess	Displays directory files according to last-accessed date from earliest to latest or in reverse order.
	[REVerse] SORT ARchive	Displays directory files according to last archived date from earliest to latest or in reverse order.
	[REVerse] SORT CReate	Displays directory files according to creation date from earliest to latest or reverse order.
	[REVerse] SORT UPdate	Displays directory files according to last -modified date from earliest to latest.
	UPdate [NOT] BEFore|EQual|AFTer *mm-dd-yy*	Displays directory files last updated before, on, or after the date you specify.
Directory	**Directories Only**	Displays only the directory subdirectories.
	SUBdirectory	Displays the directory's subdirectories and their subdirectories.
Files	**Files Only**	Displays only the directory files.
Macintosh	**MACintosh**	Displays Macintosh files and subdirectories.
Owner	**OWner [NOT] |EQual|** *name*	Displays directory files created by the same user.
	[REVerse] SORT OWner	Displays directory files by owner name in alphabetical order.
Rights	**RIGHTS**	Displays your maximum and effective rights in subdirectories; shows file flags.
Size	**SIze [NOT] GReater than|EQual|LEss than** *nnn*	Displays directory files with byte size greater than, equal to, or less than the number you specify.
	[REVerse] SORT SIze	Displays directory files according to size from smallest to largest.
	[REVerse] SORT UNsorted	Displays directory files unsorted.

NPRINT

Use NPRINT to send printer-ready files to a network printer. The files must be DOS text files or files that have already been formatted by an application for your specific printer.

Command format

NPRINT filespec [option ...]

Using NPRINT

NPRINT is useful for printing files from outside an application. If you generally print from within a network application, you will probably not need to use NPRINT.

Replace *option* with one or more of the options listed in the chart on the next page. If you do not specify any options, NPRINT uses the default settings shown in the chart.

Option	Function	Variable	Default
Banner= bannername	Specify the word to appear on the lower half of your banner page.	One word or phrase up to 12 characters long. Use the underline to represent a space between words.	The name of the file you are printing
Copies=n	Indicate how many copies of the job you want to print.	A number from 1 to 999	1
Delete	Automatically erases the file after you print it.	n/a	n/a
Form=form or n	Specify the kind of form on which you will print the job.	The name or number of the form	The form name specified in your default print job configuration (If one exists)
FormFeed	Enable form feed after your print job has been printed.	n/a	Enabled
Job=job	Specify the print job configuration to be used. (Users and supervisors can define print jobs using PRINTCON.)	The name of a print job configuration	n/a
NAMe=name	Specify the username you want to appear on the upper half of your banner page.	Any valid username	The username you used to log in.
No Banner	Specify that a banner page not be printed.	n/a	A banner page will be printed.
NoFormFeed	Disable form feed at the printer.	n/a	Form feed enabled
No NOTIfy	Inlcude if you do want to be notified that your data has been printed. Use only if NOTIfy is enabled in your print job configuration and you want to disable it.	n/a	NoNOTIfy disabled
NoTabs	Ensure that all tabs in your print job arrive at the printer unchanged. Include this if your application has a print device driver (most do).	n/a	n/a
NOTIfy	Include to be notified that your data has been printed.	n/a	Notify disabled
Queue= queue	Indicate which queue the print job should be sent to.	The name of the queue	n/a
Server= server	Indicate to which file server the data should be sent for printing.	The name of the file server	Your default server
Tabs=n	Replace all tab characters in your print job with a specified number of spaces. Include if your application does not have a print device driver.	The number from 0 to 18	8

NVER

Use NVER to determine the version of software running on your file server and workstation. Versions shown include:

- NetBIOS
- IPX/SPX
- LAN driver
- Shell
- Workstation operating system
- File server operating system

Command format

NVER

Using NVER

- NVER is placed in SYS:PUBLIC during installation.
- This utility runs from a network workstation, not the file server.

Related commands

FCONSOLE (Version Information)
SYSCON (File Server Information)

OFF

Use OFF to clear information from the file server console screen.

Command format

OFF

Using OFF

- OFF is coded into the file server operating system and ROUTER.EXE.
- Use OFF to conserve your file server monitor (much like DOS CLS) and slightly reduce operating system overhead.

PAUDIT

Use PAUDIT to view the system accounting records, including intruder detection. Accounting services must be installed on your file server.

Command format

PAUDIT

Using PAUDIT

- PAUDIT is placed in SYS:SYSTEM during installation.
- Use <Ctrl><S> to control the scrolling screen.
- Use DOS redirection (>) to save the listing to a file.
- PAUDIT accesses the NET$ACCT.DAT audit file (binary), which contains a chronological record of all accounting records. When accounting is installed, an entry is placed in the file server's audit file each time a user logs in to or out of the file server. If you do not want to keep the PAUDIT information, delete NET$ACCT.DAT. The system will create a new file for future accounting records.

Related commands

SYSCON (Accounting)

PCONSOLE

Use PCONSOLE to control network printing. PCONSOLE allows you to

- Create, delete, and rename print queues (if you have SUPERVISOR rights);
- Assign or modify print queue operators and users (if you have SUPERVISOR rights);
- View and delete print jobs in a queue;
- Change the order of print jobs in a queue;
- Change the way a job is printed;
- Print jobs on multiple file servers;
- View object ID and other information about print queues;
- Place operator hold flags on jobs in a print queue (if you are a print queue operator).

Note: If you are on a NetWare Name Service (NNS) network, use PCONSOLE to manipulate, create, and delete queues and printers; do not use command line utilities to perform these procedures.

Command format

PCONSOLE

PCONSOLE overview

If you are the owner of a print job (that is, you entered the job in the queue), you can use PCONSOLE to change the printing configurations you defined, unless the print job is already being printed. Once the job is being printed, you can still delete it from the queue.

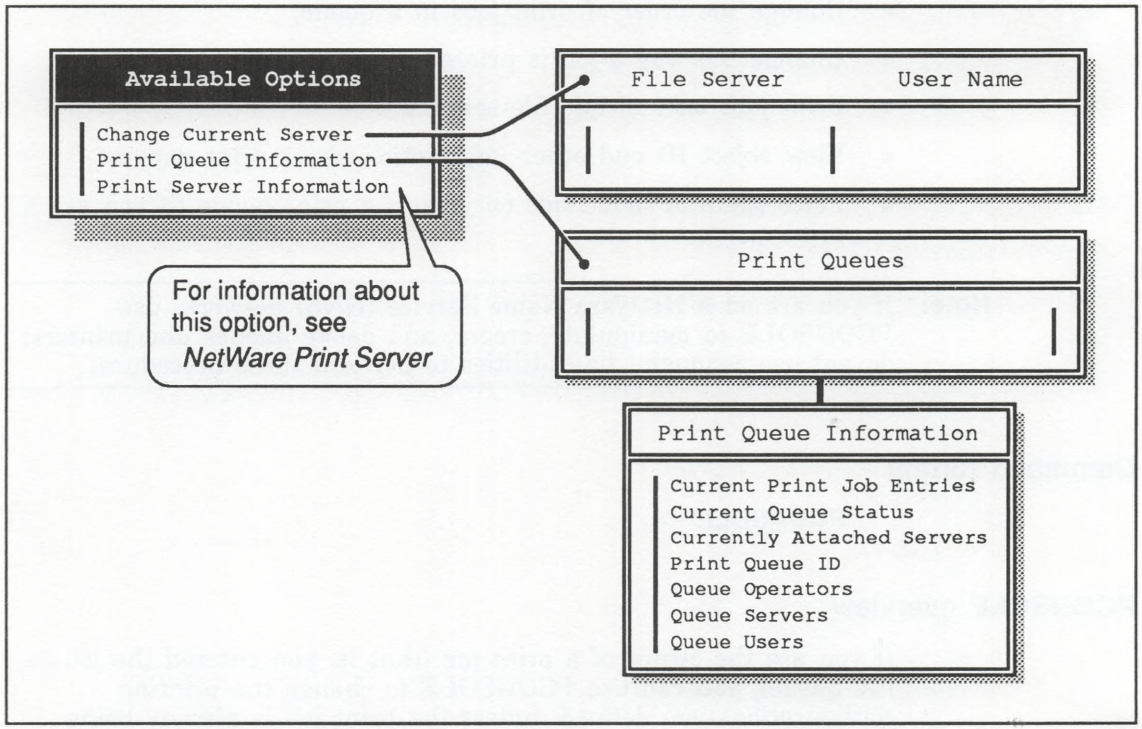
Users designated as print queue operators can edit any user's print queue entry information, delete any entry from the queue, and modify the queue status by changing the operator flags. Queue operators can also change the order of print jobs in the queue.

Note: Some printing information—such as job entry date and time, print job number, file size, and client name—cannot be changed.

If you have SUPERVISOR rights, you can create, delete, and rename print queues. You can also assign print queue users and operators.

PCONSOLE menu flow

The figure below illustrates the "Available Topics" menu and any submenus that are accessible from each option.



PCONSOLE Overview

Using PCONSOLE

The sections that follow present various menus and screens accessed through the "Print Queue Information" menu. Since the path to these menus is not direct, a quick path precedes each

screen. Additional information about menu items is available by pressing <F1> for online help.

View current print job entries

Enter PCONSOLE and follow this path.

"Print Queue Information" ↵ ↓↑ ↵ "Current Print Job Entries" ↵

Seq	Banner Name	Description	Form	Status	Job
1	LINDA	35.SCN	0	Ready	6

Print files

Enter PCONSOLE and follow this path.

"Print Queue Information" ↵ ↓↑ ↵ "Current Print Job Entries" ↵ Ins *(Type the directory where the file is located)* ↵ ↓↑ ↵ ↓↑ ↵

New Print Job to be Submitted

Print job:		File size:	
Client:	LINDA[2]		
Description:	MESSAGE.DAY		
Status:			
User Hold:	No	Job Entry Date:	
Operator Hold:	No	Job Entry Time:	
Service Sequence:			
Number of copies:	1	Form:	White_8x11
File contents:	Text	Print banner:	Yes
Tab size:	8	Name:	LINDA
Suppress form feed:	No	Banner name:	MESSAGE.DAY
Notify when done:	No		
		Defer printing:	No
Target server:	(Any Server)	Target date:	
		Target time:	

Check current queue status

Enter PCONSOLE and follow this path.

"Print Queue Information" ↵ ↓↑ ↵ "Current Queue Status" ↵

```
Current Queue Status

Number of entries in queue:                1
Number of servers attached:                0

Operator Flags
   Users can place entries in queue:      Yes
   Servers can service entries in queue:  Yes
   New servers can attach to queue:       Yes
```

Check currently attached servers

Enter PCONSOLE and follow this path.

"Print Queue Information" ↵ ↓↑ ↵ "Currently Attached Servers" ↵

```
Currently Attached Servers
```

Check print queue ID

Enter PCONSOLE and follow this path.

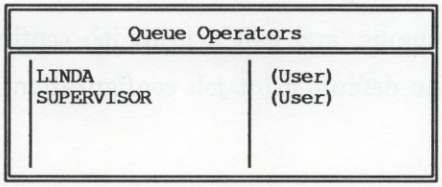
"Print Queue Information" ↵ ↓↑ ↵ "Print Queue ID" ↵

```
Object ID: 158F00DB
```

View queue operators

Enter PCONSOLE and follow this path.

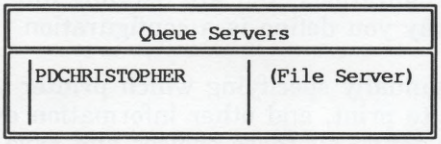
"Print Queue Information" ↵ ↓↑ ↵ "Queue Operators" ↵



View currently attached servers

Enter PCONSOLE and follow this path.

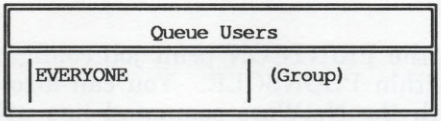
"Print Queue Information" ↵ ↓↑ ↵ "Queue Servers" ↵



View queue users

Enter PCONSOLE and follow this path.

"Print Queue Information" ↵ ↓↑ ↵ "Queue Users" ↵



PRINTCON

Use PRINTCON to set up print job configurations. (A print job configuration describes the way you want your job to be printed.) All users can use PRINTCON to

- Create a print job configuration;
- Delete, rename, and edit a print job configuration;
- Choose the default print job configuration.

Command format

PRINTCON

PRINTCON overview

You save yourself time and effort when you set up your own print job configurations with PRINTCON. Print job configurations make network printing simpler. When you use PRINTCON to set up print job configurations, you are defining different ways to print a file. Each way you define is a configuration.

Instead of manually specifying which printer you want to use, how many copies to print, and other information every time you print a file, you can define all those choices and save them as a print job configuration. Create as many configurations as you have types of print jobs.

Using PRINTCON with other utilities

You can use the forms and modes set up in PRINTDEF, along with other parameters unique to PRINTCON, to define a print job configuration.

You can use the PRINTCON print job configurations when you print from within PCONSOLE. You can also specify them when you print with the NetWare command line utilities (CAPTURE and NPRINT).

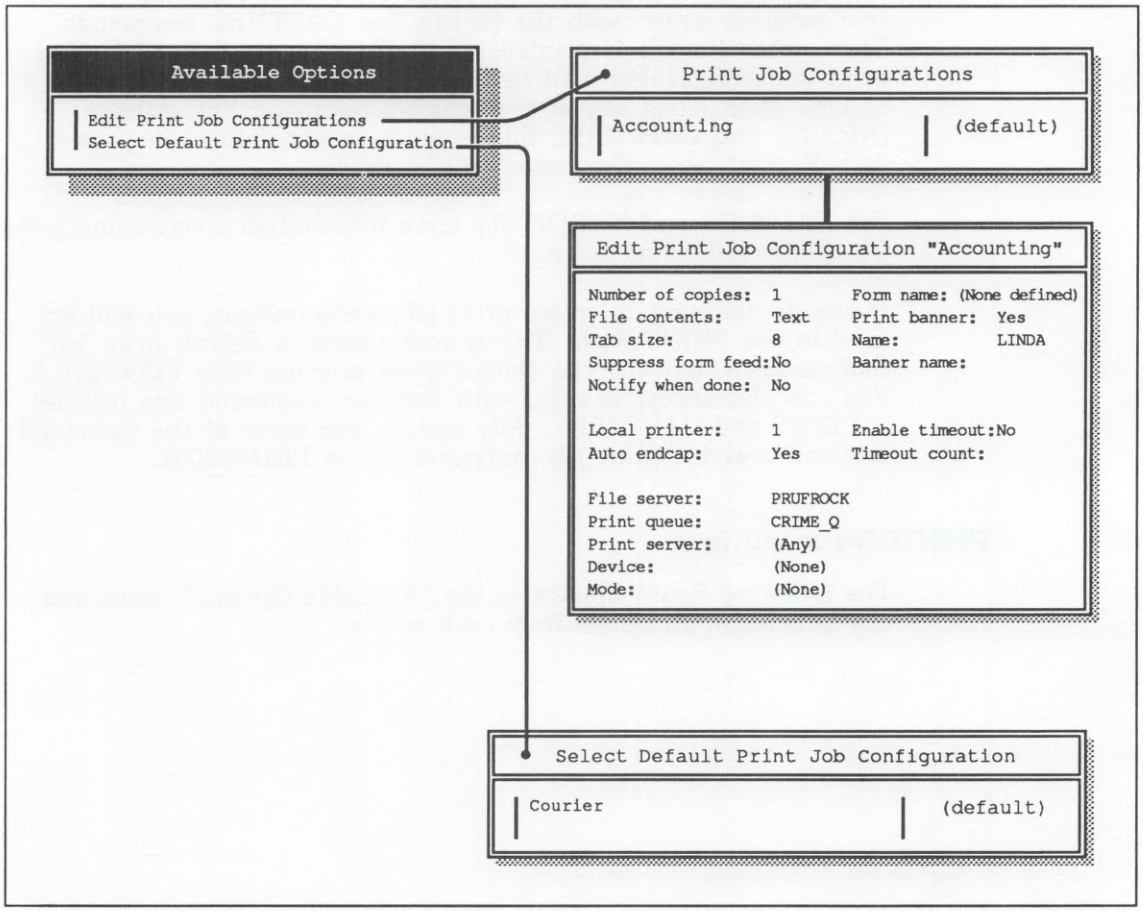
For example, you may specify the job = name of print job configuration option with the NPRINT or CAPTURE commands. Then, when the file is printed, all the parameters defined in that print job configuration will be used. If you do not specify any options when using any of the printing command line utilities (NPRINT and CAPTURE), the parameters you defined in your default print job configuration will be used.

See CAPTURE and NPRINT for more information about using print job configurations as options.

If you do not want to create print job configurations, you will not need to use PRINTCON. The system creates a default print job configuration that you can choose when printing from PCONSOLE. You can also choose to print with NetWare command line utilities (NPRINT and CAPTURE). Any options you enter at the command line will override print job configurations in PRINTCON.

PRINTCON menu flow

The following figure illustrates the "Available Options" menu and any submenus accessible from each option.



PRINTCON Overview

Using PRINTCON

The sections that follow present various menus and screens accessed through the "Print Job Configurations." Since the path to these menus is not as direct, a quick path precedes each screen. Additional information about menu items is available by pressing <F1> for online help.

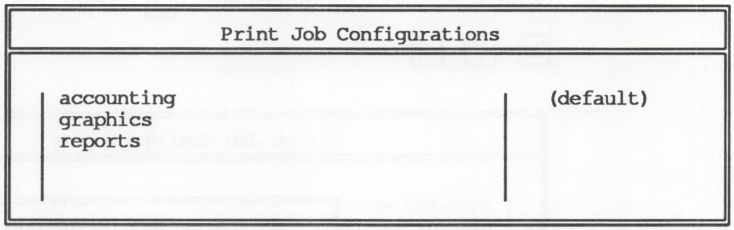
Choosing the default print job configuration

The default print job configuration you choose will become the default for files you print with PCONSOLE. It will also determine

the default settings for files you print with the NPRINT and CAPTURE/ENDCAP. If you print a file with either NPRINT or CAPTURE and you do not specify any options, the file will be printed according to your default print job configuration in PRINTCON. However, any options you enter at the command line will override the defaults.

Enter PRINTCON and follow this path.

"Select Default Print Job Configuration" [↵] "Select Default Print Job Configuration" [↓][↑] [↵]



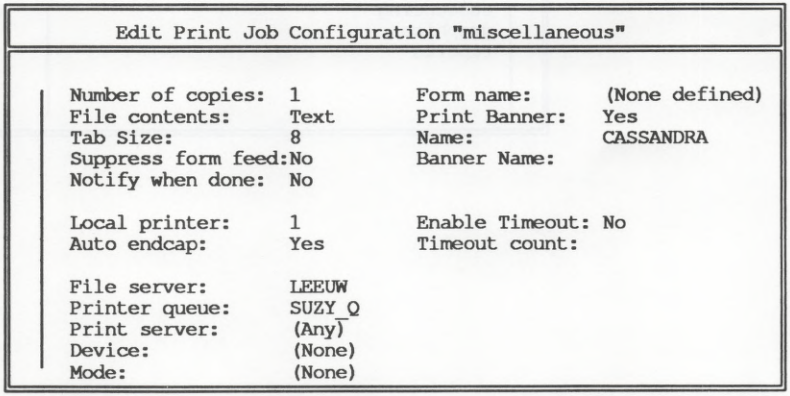
Creating a print job configuration

The first print job configuration you create will become your default print job configuration. To use another configuration as the default configuration, see "Choosing the Default Print Job Configuration" on the preceding page.

Enter PRINTCON and follow this path.

"Edit Print Job Configurations" [↵] "Print Job Configuration" [Ins]

(Type a name for the new configuration) [↵] *(Specify parameters)*



Note: If no print job configurations have been defined, an error message may appear after you enter the new name. Read the message and then press <Esc>. The "Edit Print Job Configuration" table will then appear.

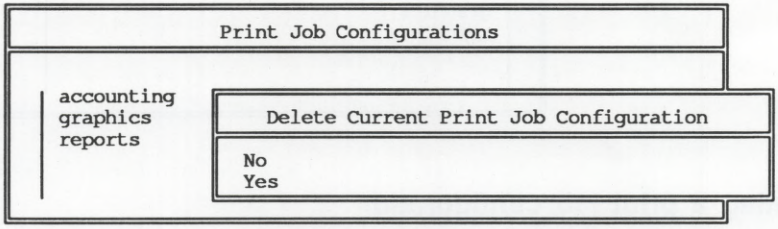
Deleting a print job configuration

You can use PRINTCON to delete any print job configuration except the default configuration.

Enter PRINTCON and follow this path.

"Edit Print Job Configurations" [↵] "Print Job Configuration" [↓][↑]

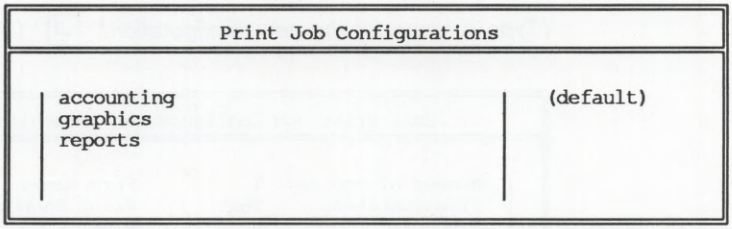
[Del] [Y] [↵]



Listing print job configurations

Enter PRINTCON and follow this path.

"Edit Print Job Configurations" [↵]

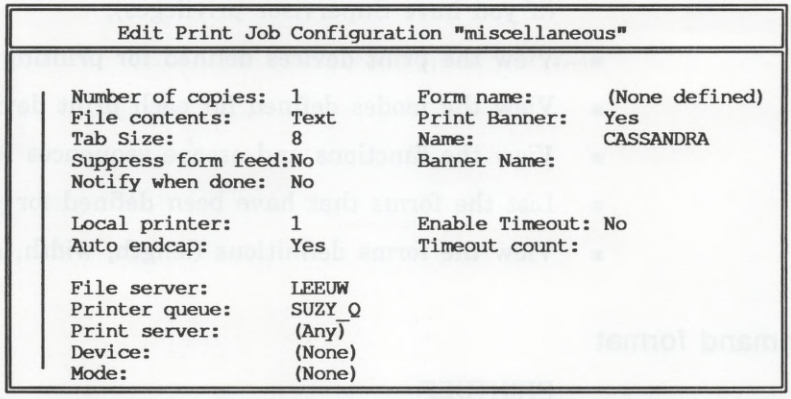


Modifying a print job configuration

You can add or change parameters for print job configurations.

Enter PRINTCON and follow this path.

"Edit Print Job Configurations" ↵ "Print Job Configuration" ↓↑ ↵ *(Edit the print job configuration)* Esc Y ↵

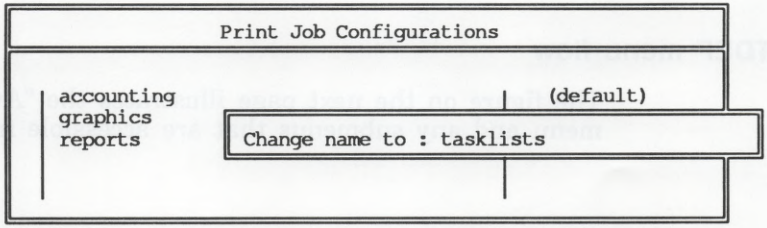


Renaming a print job configuration

You can modify the name of an existing print job configuration.

Enter PRINTCON and follow this path.

"Edit Print Job Configurations" ↵ "Print Job Configuration" ↓↑ *(Highlight the configuration)* F2 *(Modify the name)* ↵



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PRINTDEF

Use PRINTDEF to

- Define a device driver for network printers, plotters, and other devices (if you have Supervisor privileges);
- Define the forms (types of paper) that the print devices will use (if you have Supervisor privileges);
- View the print devices defined for printing;
- View the modes defined for each print device;
- View the functions and escape sequences for each mode;
- List the forms that have been defined for your print device;
- View the forms definitions (length, width, name, and number).

Command format

PRINTDEF

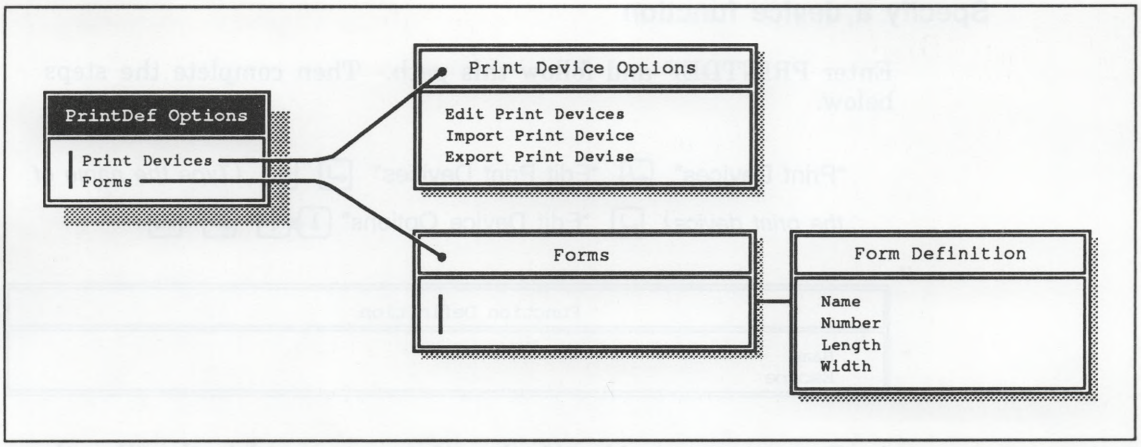
PRINTDEF overview

The information defined in PRINTDEF is used by PRINTCON to create customized print job configurations. NPRINT, CAPTURE, and PCONSOLE can use the device driver via PRINTCON.

NetWare includes print device definitions for 30 popular printers. If you need instructions for copying these definitions, see "Using core printing" on page 131.

PRINTDEF menu flow

The figure on the next page illustrates the "Available Options" menu and any submenus that are accessible from each option.



PRINTDEF Overview

Using PRINTDEF

The sections that follow include detailed instructions for defining your own print device definitions. In addition, various menus and screens accessed through the "Print Device Options" menu are shown. Since the path to these menus is not as direct, a quick path precedes each screen. Additional information about menu items is available by pressing <F1> for online help.

Define print devices

If your print devices (printers, plotters, etc.) are not included among the definitions provided with NetWare, you will need to define your own print device functions and print device modes for each device you will be using.

Print functions (also referred to as escape sequences or printer commands) give instructions to the printer. You will use these functions to create print device modes. To define a printer's functions, you enter escape sequences or printer commands into the PRINTDEF database. To do this, you need the technical reference manual that came with your printer.

Specify a device function

Enter PRINTDEF and follow this path. Then complete the steps below.

"Print Devices" ↵ "Edit Print Devices" ↵ Ins *(Type the name of the print device)* ↵ "Edit Device Options" ↓↑ ↵ Ins

```
Function Definition

Name
Escape
```

1. Type a name to identify the printer command in the "Function Definition" form, and press <Enter>.
2. Type the escape sequence supplied by the device's documentation, and press <Enter>. Press <F1> for a description of characters that can be used in escape sequences.

Note: When you enter the print functions, be sure to include the reset escape sequence.

Edit a device function

Enter PRINTDEF and follow this path.

"Print Devices" ↵ "Edit Print Devices" ↵ ↓↑ ↵ "Device Functions" ↵ ↓↑ F3 *(Modify the device function)*

```
Function Definition

Name: Character Pitch 10 CPI
Escape Sequence: <ESC>?"<SP>
```

Note: Because NetWare can only place the functions at the beginning or end of a print job, the best functions to use are those that affect the entire document (such as Condensed or Landscape).

Define print device modes

After you define the functions for a print device, you can combine these functions into modes. A mode is a sequence of print functions telling the printer how to print a particular job. As a network supervisor, you must determine what your printing needs are and then define the modes.

Enter PRINTDEF and follow this path.

"Print Devices" ↵ "Edit Print Devices" ↵ "Defined Print Devices" ↓↑ ↵ "Device Modes" ↵ ↓↑ ↵

Additional C.Itoh Functions	
Print Width: 136 @ @10 CPI	<ESC>?&<SP>
Reset EAROM	<ESC>><SP>
Underline OFF	<ESC>2<SP>
Underline ON	<ESC>2!
Wide Carriage	<ESC>?&<SP>

Note: If your printer does not have a single reset function, you must enter all your printer's "Cancel" functions into the Re-initialize mode. Mark multiple functions by highlighting each and pressing <F5> (the Mark key).

Define a form

Forms are the types of paper on which files can be printed (single sheets of paper, continuous-feed paper, labels, etc.).

To define a form, enter PRINTDEF and follow this path.

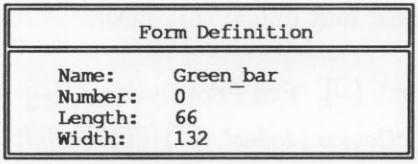
"Forms" ↵ Ins

Form Definition
Name:
Number:
Length:
Width:

Modify form definitions

Enter PRINTDEF and follow this path.

"Forms" ↵ ↓↑ ↵

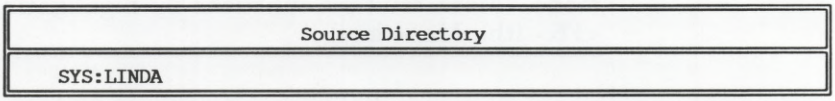


Import a print device

To import a print device from another server, enter PRINTDEF and follow this path.

"Print Devices" ↵ "Import Print Device" ↵ "Source Directory"

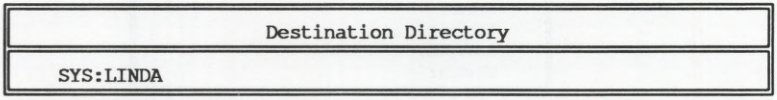
(Type path or press Ins to select the path from lists)



Export a print device

To export a print device to another server, enter PRINTDEF and follow this path.

"Print Devices" ↵ "Export Print Device" ↵ "Defined Print Devices" ↓↑ ↵ "Destination Directory" *(Type path or press Ins to select the path from lists)*



PRINTER

Use PRINTER to

- Control paper (form) types and positions in a printer
- Control printers and print job priority
- Work with printers (create, destroy, and configure)
- Work with print queues (list, add, remove, and reroute)

The specific PRINTER functions are explained in four sections following the explanation of the command format.

Note: If you are on a NetWare Name Service (NNS) network, do not use this command; use PCONSOLE instead.

Command format

P[RINTER] [Options]

Using PRINTER

The printing commands are summarized in the chart on the next page.

The variable *nn* indicates the printer number between 0 and 4. Printer definitions need not be consecutive.

You can get help at the file server console by typing

P[RINTER] HELP <Enter>

You will see a list of all the current options you can enter with PRINTER, along with a brief description of what each option allows you to do. The chart on the next page contains more detailed information about each option.

Printing command	Function
P[RINTER]	Lists all printers attached to the file server. It includes status (on- or off-line), form number mounted, and number of queues serviced.
P[RINTER] HELP	Lists printer commands available at the file server console.
P[RINTER] *nn* ADD QUEUE *name* AT PRIORITY	Adds queue to printer. (You must create the queue first.)
P[RINTER] *nn* CONFIG	Displays a printer's configuration.
P[RINTER] nn CREATE device [Baud=x] [WordSize=x] [Parity=x] [XonXoff=x] [Stopbits=x] [Poll=x]	Modifies a serial printer's configuration. To use the defaults, do not specify any settings. You change only the settings that you specify. Unspecified settings remain unchanged. Baud, Wordsize, Parity, XonXoff, and Stopbits are valid only for serial printer. Poll may be used for either serial or parallel ports.
P[RINTER] *nn* CREATE *device*	Creates a printer process. Replace *device* with a port (LPT1, COM1, etc.).
P[RINTER] *nn* DELETE QUEUE *name*	Temporarily removes a queue from set of queues being serviced by a printer. To remove a queue permanently, use SYSCON to remove the corresponding PRINTER command from the AUTOEXEC.SYS file.
P[RINTER] *nn* FORM FEED	Advances paper in printer by one page. Use with FORM MARK to correctly position forms in the printer.
P[RINTER] *nn* FORM MARK	Marks top of form in printer. Use with FORM FEED to correctly position forms in the printer.
P[RINTER] *nn* MOUNT FORM*x*	Changes form type mounted in printer. Form numbers are defined in PRINTDEF.
P[RINTER] *nn* POLL*x*	Sets printer polling period. The polling period specifies the amount of time the printer monitoring process waits before checking print queues for print jobs. The default is 15 seconds; you can specify from 1 to 60 seconds. This is the same as the PRINTER CONFIG POLL = x command.
P[RINTER] *nn* QUEUE	Lists printer's queues and their priority levels.
P[RINTER] *nn* REWIND *x* PAGES	Rewinds printer. Specify 0 to reprint starting with the current page. Do not specify a page number to reprint the entire job. If you specify a number greater than 9, if the file is not an ASCII file, or if the printing file contains no form feeds, the entire job will be reprinted. (You do not need to stop the printer to rewind.)
P[RINTER] *nn* START	Starts printer after you have used the STOP command.
P[RINTER] *nn* STOP	Stops printer.

PSTAT

Use PSTAT to view printer status.

Command format

PSTAT [S=servername] [P=printername | printernumber]

Using PSTAT

- PSTAT is placed in SYS:PUBLIC during installation.
- PSTAT indicates the printer number and paper and if it is on-line or active.

Related commands

PRINTER

PURGE

Use PURGE to permanently delete previously erased files.

Command format

PURGE [filename|path] [/All]

Using PURGE

- PURGE is placed in SYS:PUBLIC during installation.
- PURGE supports wildcard characters.
- If you use PURGE alone or with *.*, you lose all recoverable files in your current directory.
- If your workstation is attached to more than one file server, PURGE deletes only those recoverable files that you own and that are located on the file server your current drive is mapped to.

Related commands

FCONSOLE (Purge All Salvageable Files)
SALVAGE (Recover Deleted Files)

PURGE

Use PURGE to permanently erase previously erased files.

Command format

PURGE

Using PURGE

- PURGE is coded into the file server operating system.
- PURGE removes all users' salvageable files, so use it at times when few or no users are logged in.

Related commands

FCONSOLE (Purge All Salvageable Files)
SALVAGE (Recover Deleted Files)

QUEUE

Use QUEUE to

- List, move, and delete print jobs in a queue;
- List, create, and destroy print queues.

Command format

Q[UEUE] [options]

Using QUEUE

Most tasks you can perform using QUEUE require additional words and variables. Use the queue commands on the chart on the next page to choose the task you want.

Do not use this command if you are on a NetWare Name Service (NNS) network; use the PCONSOLE utility instead.

If a printer malfunctions and you do not want to lose all the jobs in that printer's queues, do not delete all jobs in the print queue. Instead, transfer the entire queue to a different printer, using the PRINTER command.

Queue command	Function
Q[UEUE]	Lists all print queues, including the queue name, number of jobs in each queue, and number of printers servicing each queue.
Q[UEUE] HELP	Presents a summary of the available QUEUE commands.
Q[UEUE] *name* CHANGE JOB *nn* TO PRIORITY *xx*	Changes job priority in a queue. Use priority 1 to move a job to the beginning of the queue or specify a number greater than the number of jobs in the queue to move the job to the end of the queue.
Q[UEUE] *name* CREATE	Creates a new print queue. When the queue is created, the group EVERYONE is given rights to use the queue, the supervisor is given operator rights to the queue, and the file server is given rights to service the queue. After you create a queue, you must add the queue to a printer with the PRINTER ADD QUEUE command. You must also create a spooler assignment to the new queue.
Q[UEUE] *name* DELETE JOB *nn /**	Deletes one or more jobs in a queue. You can specify a single job for deletion using the job number or you can specify all jobs for deletion by using an asterisk.
Q[UEUE] *name* DESTROY	Destroys a print queue and all jobs in the queue. You cannot recover either the queue or the jobs that were in it.
Q[UEUE] *name* JOBS	Lists queue contents, including each job's priority, the user who sent the job, the filename and job number, and the number of copies being printed.

The QUEUE *name* DESTROY command destroys the queue completely. You cannot recover the queue or any jobs that were in it. If you want to destroy all jobs in a queue without destroying the queue itself, use the QUEUE *name* DELETE JOB * command. If you want to disable the connection between a queue and a particular printer without destroying the queue, use the PRINTER *nn* DELETE QUEUE *name* command, explained in "Using core printing."

REMIRROR

Use REMIRROR to restore mirroring or duplexing protection and synchronize a pair of disk drives after one has been unmirrored, has failed, or has been shut off (in a disk subsystem).

Command format

REMIRROR nn

Using REMIRROR

- REMIRROR is coded into the dedicated file server operating system.
- Make sure all users are logged out (use BROADCAST along with DISABLE LOGIN).
- If the file server was rebooted while the failed drive was unmirrored, all data on the functioning drive will be copied to the restored drive. If the file server was not rebooted while the failed drive was unmirrored, only the data that changed will be copied to the restored drive.
- For example, suppose drive 01 was previously mirrored with drive 00. (DISK shows drive 01 is dead.)

```
                    PHYSICAL DISK STATUS AND STATISTICS
      cha     con     drv     stat      IO Err      Free      Used
00    1       0       0       OK        0           112       10
01    1       1       1       D-00      0           444       26
```

Restore drive 01 and reactivate the mirroring feature by typing

```
REMIRROR 01  <Enter>
```

Each drive pair requires a separate command. Use UNMIRROR to remove it.

Related commands

BROADCAST
CLEAR STATION
DISABLE LOGIN
DISK
ENABLE LOGIN
UNMIRROR

REMOVE

Use REMOVE to delete a user or group from a directory's trustee list.

Command format

REMOVE [USER|GROUP] name [FROM] [path] [option...] [/SUB]

Using REMOVE

- REMOVE is placed in SYS:PUBLIC during installation.
- Only a name (user or group) is required. If a user and a group have the same name, however, use GROUP before the name because the default always removes the user.
- SUB removes the specified group or user trustee from all subdirectories in the specified path.
- Use TLIST to view the trustee list of a directory. FILER and SYSCON also view and remove trustees. MAKEUSER may remove trustees. For a complete explanation of trustee rights, see **Security** in *Concepts*.
- When GRANT assigns even one trustee right, it assigns that user or group automatically to that directory's trustee list. REVOKE takes away trustee rights, but the user or group remains a trustee until removed from that directory.

Related commands

FILER (Current Directory Information)
GRANT
MAKEUSER
REVOKE
SYSCON (Group Information, User Information)

RENDIR

Use RENDIR to rename a directory.

Command format

RENDIR path new_directory_name

Using RENDIR

- RENDIR is placed in SYS:PUBLIC during installation.
- RENDIR changes only the directory name without affecting the directory's trustee list or users' rights. However, drive mappings in login scripts (if they exist) must be changed to reflect the new name of the directory.
- Use a period (.) in place of *path* to represent your default directory to change its name.

Related commands

FILER (Directory Contents)

RESET ROUTER

Use RESET ROUTER to reset the router table in the file server or router if this table becomes inaccurate or corrupted.

For example, if several file servers or bridges on your network go down, any packets sent to or through their routers are lost. If you reset the router in each file server that is up, the router will send a request (an advertising packet) to nearby file servers to verify any other networks they know about. The router builds a new, accurate router table from this information.

Command format

RESET ROUTER

Using RESET ROUTER

- RESET ROUTER is coded into the file server operating system and ROUTER.EXE.
- In normal situations, the router updates its tables every two minutes to automatically handle situations in which other servers or their routers have gone down. This command speeds up the normal process of updating the Router table.

Related commands

TRACK ON

REVOKE

Use REVOKE to take directory trustee rights from a user or group.

Command format

REVOKE rightslist... [path] FROM [USER|GROUP] name [/SUB]

Using REVOKE

- REVOKE is placed in SYS:PUBLIC during installation.
- Use the following chart to choose from REVOKE's options.

Option	Description
ALL	Revokes the specified user all trustee assignments.
Read	Allows users to open and read files.
Write	Allows users to open and write to existing files.
Create	Allows users to create directories and files.
Erase	Allows users to delete a directory, its files, and subdirectories.
Modify	Allows users to change directory and file names and attributes (with File scan), but not their contents.
File scan	Allows users to see files.
Access control	Allows users to change trustee assignments and the Maximum Rights Masks.

- SUB revokes the specified rights in all subdirectories.
- You must have the Access Control right in the directory where you want to revoke trustee rights from users or groups (each user or group requires a separate command). If you want to remove a directory trustee, use REMOVE.

Related commands

GRANT
REMOVE
SYSCON (Group Information, User Information)

RIGHTS

Use RIGHTS to view your effective rights in a directory.

Command format

RIGHTS [path]

Using RIGHTS

- RIGHTS is placed in SYS:PUBLIC during installation.
- Use the following chart to choose from the various rights.

Right	Description
Read	Allows users to open and read files.
Write	Allows users to open and write to existing files.
Create	Allows users to create directories and files.
Erase	Allows users to delete a directory, its files, and subdirectories.
Modify	Allows users to change directory and file names and attributes (with File scan), but not their contents.
File scan	Allows users to see files.
Access control	Allows users to change trustee assignments and the Maximum Rights Masks.

Related commands

FILER (Current Directory Information)
GRANT
REMOVE
REVOKE
SYSCON (Group Information, User Information)

SALVAGE

Use SALVAGE to recover one or more files you deleted (erased) from anywhere on a volume.

Command format

SALVAGE [path]

Using SALVAGE

To recover a file or files that you deleted, specify the volume from which the file was deleted. Then specify the path. SALVAGE finds the files that were deleted with the last DELETE or ERASE command issued at the command line.

If you specify a directory or file rather than a volume, SALVAGE truncates the path to the volume level and recovers the last files you deleted.

Note: If you deleted files permanently using the NetWare PURGE command, those files cannot be recovered.

How SALVAGE works

SALVAGE recovers only files you deleted with a DOS DELETE or ERASE command.

If you deleted one file with the last DELETE command, SALVAGE recovers only that file. If you deleted several files (using *.* or other wildcard character combination), SALVAGE recovers all those files.

SALVAGE restores files to the directory where they were deleted.

If you accidentally delete a file

- Do not log out of your file server. Once you log out, you cannot recover the file.
- Do not create or delete any more files on the volume from which your file was deleted. SALVAGE cannot recover a file once another file has been created or deleted on the same volume.

- Do not issue a PURGE command. PURGE deletes recoverable files.
- You must issue the SALVAGE command at the same workstation where the file was deleted.
- When you use SALVAGE, you must specify the volume where the file was deleted. SALVAGE returns the recovered file to its original directory.

Related commands

FCONSOLE (Purge All Salvageable Files)
PURGE

SECURITY

Use SECURITY to find possible file server security violations.

Command format

SECURITY

Using SECURITY

- SECURITY is placed in SYS:SYSTEM during installation.
- You must decide which aspects of NetWare security to implement—SECURITY does not correct violations for you.
- Use DOS redirection (>) to save the listing to a file.

What SECURITY does

SECURITY examines the bindery for potential security problems on your network and reports the following possible violations.

No password assigned

Anyone can log in to an account that does not have a password. Without password protection for user GUEST, anyone can obtain a list of all users on a file server through this account. The potential damage depends on the privileges assigned to any account without a password—if security equivalent to the SUPERVISOR, an intruder will have full access to the file server.

Insecure accounts

The following are defined as insecure accounts, and need to be corrected.

- Accounts that have passwords that are the same as the username
- Accounts not required to have a password at least five characters in length
- Accounts not required to change passwords at least every 60 days

- Accounts that have unlimited grace logins after a password has expired
- Accounts not required to use a new and unique password each time (up to 10 times) the password changes

SUPERVISOR equivalence

Accounts that are security equivalent to SUPERVISOR multiply security risks, but one plausible, fictitious user with SUPERVISOR equivalence and password allows "back door" access if needed.

The network supervisor should always have an account as a regular network user and log in as SUPERVISOR only when there are supervisor tasks to perform. Unattended workstations logged in as SUPERVISOR allow anyone unlimited access.

Root directory privileges

Users who have been granted rights in the root directory of a volume have those rights to the entire volume unless specifically revoked at a lower level. A user with the Access Control right at the root can grant all rights anywhere on the volume. Users should have rights only to the specific directories they access.

Excessive rights

Users should have only the following rights in these directories:

```
SYS:SYSTEM      [       ]
SYS:PUBLIC      [ R   F ]
SYS:LOGIN       [ R   F ]
SYS:MAIL        [ W C   ]
```

Only the user to whom the mail directory belongs has more than Create and Write rights under SYS:MAIL.

Login scripts

Login scripts are kept in the user's respective mail directory, where everyone has Create and Write rights (so that mail can be delivered). This also allows any user to create a login script for any other user (even the SUPERVISOR) who doesn't already have a login script. To prevent a user from creating a login script that grants him or her all the rights when the other user logs in, make sure that all users have login scripts.

Related commands

FILER (Current Directory Information)
GRANT
REMOVE
REVOKE
SYSCON (Group Information, User Information)
TLIST

SEND

Use SEND to send a brief message to one or more users or groups on your network.

Command formats

SEND "message" [TO] [USER|GROUP] [fileserver/]
username|groupname|EVERYBODY|CONSOLE|STATION|n
[AND|,| [n...] [fileserver/]]

Using SEND

- SEND is placed in SYS:PUBLIC during installation.
- Only IBM and compatible workstations support SEND.
- Type a message that includes up to 45 characters minus the number of characters in your username.
- Include the file server name only if the user to whom you want to send a message is not logged in to your file server.
- If you send a message to several specific users, groups, or workstation numbers (*n*), separate them with commas or blank spaces.
- USER is the default, so include GROUP in a SEND command only if both a user and a group have the same name and you want to send a message to the group.
- If you do not want to receive SEND messages, use CASTOFF. Use CASTON to receive messages again.

Related commands

ATTACH
BROADCAST
CASTOFF
CASTON
SESSION (User List)

SESSION

Use SESSION to

- View or temporarily change your drive or search drive mappings;
- Select your default drive;
- List user information and send messages to users;
- List group information and send a message to a group.

Command format

SESSION

SESSION overview

When you view information about drive mappings (including search drive mappings) in SESSION, you see

- The drive type (local or network);
- Your effective rights in the directory the drive is mapped to (if you are viewing information about network drives).

You can map both network drives and search drives in SESSION. These drive mappings are temporary, however, and are only usable until you log out.

If you want to map network or search drives permanently, use SYSCON to map the drives in your login script.

Note: If you delete a mapping for a network drive that was originally a local drive, the drive regains its local drive status.

Work with search drive mappings

Add a mapping. You can define up to 16 search drive mappings. These are labeled sequentially by number and letter (numbers begin with 1; letters begin with Z).

For example, the first search drive is assigned the number 1 and the letter Z; the second is assigned the number 2 and the letter Y; and so on.

If you want to insert a search drive mapping out of sequence, you can delete the current number when you go to insert the mapping using SESSION.

Modify a mapping. When you modify a network search drive mapping you see the "Select Directory" entry box and backspace over the parts of the directory name you want to change. If you modify a local search drive mapping, the entry box appears but is blank.

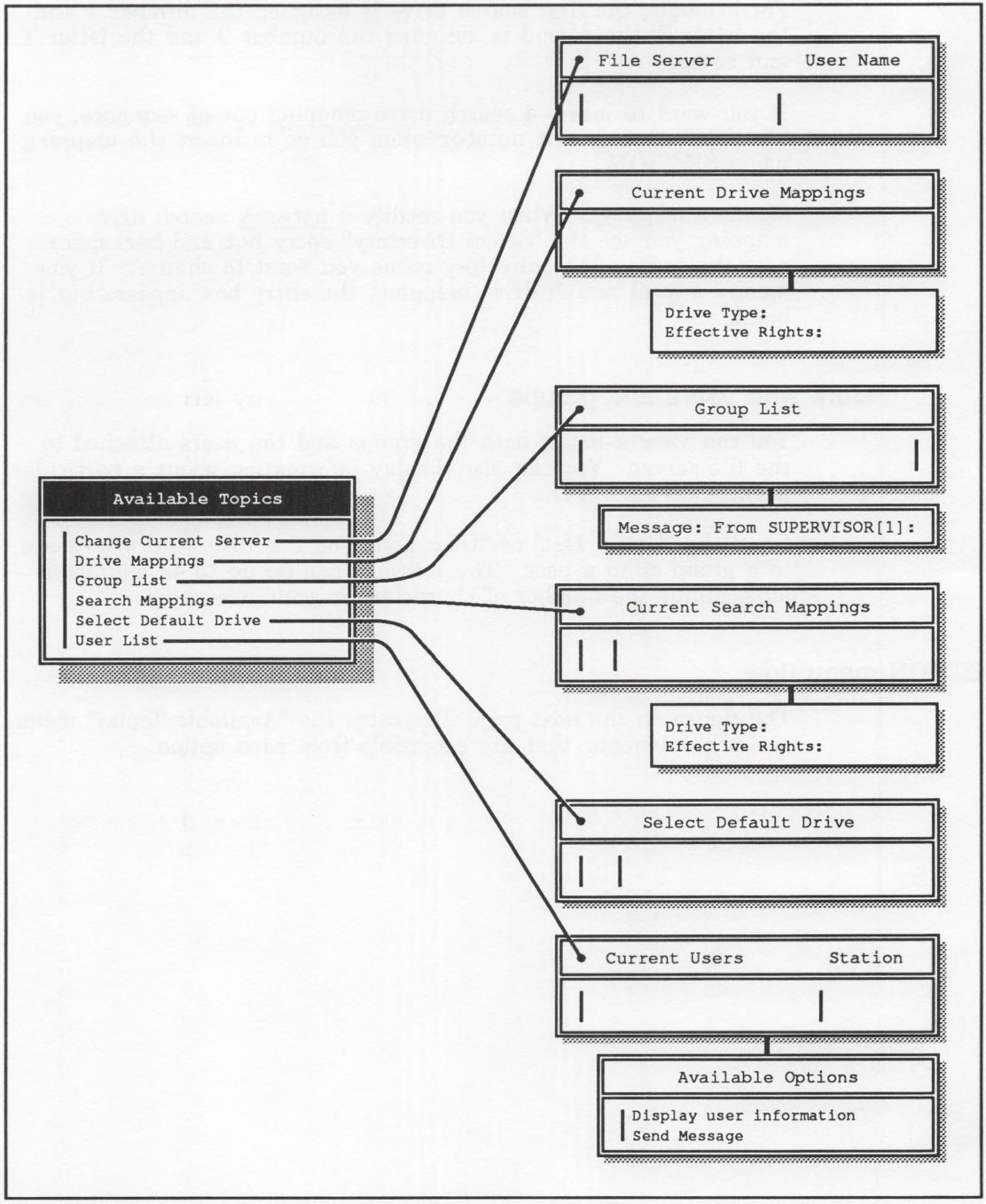
Work with users and groups

You can view a list of both the groups and the users attached to the file server. You can also display information about a particular user.

From the "Group List" or "User List" you can also send a message to a group or to a user. The message can be up to 43 characters long, minus the number of characters in your username.

SESSION menu flow

The figure on the next page illustrates the "Available Topics" menu and the submenus that are accessible from each option.



SESSION Overview

SET TIME

Use SET TIME to set the date and time kept by the file server.

Command format

SET TIME [month/day/year] [hour:minute:second]

Using SET TIME

- SET TIME is coded into the file server operating system.
- Enter the time in either standard or military format. Separate the hours, minutes, and seconds with colons (hours:minutes: seconds). You may omit the minute and second entries but must include the colon after the hour. If you do not specify AM or PM, the file server supplies this information for you, based on usual working hours. The file server always displays the time in the standard format.
- Enter the date in any of these formats:

  11/28/91
  November 28, 1991
  28 November 1991

- You can set the date and time separately or in the same command with either date or time first. If you replace only one variable, the other variable remains unaffected.
- If you do not enter either the date or the time, the file server console displays the current date and time recorded in the file server's clock.

Related commands

TIME

SETPASS

Use SETPASS to create or change your password on one or more file servers.

Command format

SETPASS [fileserver][/username]

Using SETPASS

- SETPASS is placed in SYS:PUBLIC during installation.
- Enter a password that consists of up to 127 characters but does not include control characters.
- If you are attached to more than one file server, SETPASS asks if you want to synchronize passwords.
- As SUPERVISOR or a user with SUPERVISOR rights you can set another user's password by using the */username* variable.

Related commands

SYSCON (User Information)

SETTTS

Use SETTTS to ensure that the Transaction Tracking System (TTS) works in harmony with your application in tracking a transaction.

Command format

SETTTS [logical level [physical level]]

Using SETTTS

- SETTTS is placed in SYS:PUBLIC during installation.
- The TTS feature must be installed on your file server.
- Use SETTTS if your application uses transactional data files (for example, database management, accounting systems, inventory maintenance, etc.) and requires you to set new transaction beginning points. (Files can be flagged Transactional using FLAG or FILER.)

Note: Currently, dBASE III PLUS v1.0 is the only software program tested that requires you to use SETTTS. Version 1.0 uses an immediate record lock for copy protection and does not release the lock until you exit the program. Later versions of dBASE III PLUS (v1.1 and above) do not use record locks in this way and can be used normally.

- Once you specify the number of logical and physical record locks TTS will ignore, you can change the settings only by issuing another SETTTS command, logging out, or rebooting your workstation.

Related commands

DISABLE TRANSACTIONS
ENABLE TRANSACTIONS

SLIST

Use SLIST to view a list of the file servers on your internetwork and information about those file servers.

Command format

SLIST [fileserver] [/C]

Using SLIST

- SLIST is placed in SYS:LOGIN and SYS:PUBLIC during installation.
- Include the /C (Continuous) option if you want the list of file servers to scroll down the screen without stopping.
- The screen display shows the network address and station (node) address on LAN A.

Related commands

ATTACH
LOGIN
MAP

SMODE

Use SMODE to assign or view the search mode of an executable file. The search mode specifies how a program will use search drives when looking for a data file.

Command format

SMODE [path] filename [mode] [/SUB]

Using SMODE

- SMODE is placed in SYS:PUBLIC during installation.
- Replace *mode* with the number of the search mode (0 through 7) you want to assign to the file specified in your command.
- Include /SUB in the command to extend the search mode assignment to include all subdirectories of the specified directory. If you include /SUB in the command, you must also include the variable *path* in the command.
- Once you assign a search mode to an executable file, only another SMODE command will change the search mode.
- Use <Ctrl><S> to control screen scrolling.

The following chart explains how and when the shell will search for a data file according to the search mode.

Mode	Description
0	No search instructions. Instead, the executable file will look for instructions in the SHELL.CFG file. (You can use this mode if you set SEARCH MODE in the SHELL.CFG file.)
1	Search if a path is not specified.
2	Never search.
3	Search if a path is not specified and the request is only to read (not write to or modify) the file.
4	Reserved for future use.
5	Always search.
6	Reserved for future use.
7	Always search if the request is only to read (not write to or modify) the file.

What SMODE does

When an .EXE or .COM file requires an auxiliary file, it makes an open request through the operating system. The request may or may not specify the path to that file. If a path is specified, the operating system will search that path. Otherwise, it will only search the default directory.

If the file is not found, the NetWare shell enhances the search capabilities of the operating system by using the search mode of the executable file to determine if it will continue looking for the file in the search drives. SMODE allows you to individually set the search mode for your executable files, or you may set the shell's search mode in the SHELL.CFG file for the majority of your files. SEARCH MODE = *mode* is documented in "Managing DOS workstations" on page 48.

The NetWare shell uses two criteria to decide whether or not to use the search drives. The first is whether or not the request to open the file specified a path. The second is whether or not the request to open the file was to only read the file or to read and write to the file.

The following chart summarizes whether the shell will search.

Mode	Path Specified		No Path Specified	
	Read	Write	Read	Write
1			Yes	Yes
2				
3			Yes	
5	Yes	Yes	Yes	Yes
7	Yes		Yes	

Related commands

MAP
SESSION (Search Mappings)

SPOOL

Use SPOOL to list and change spooler assignments.

Command format

SPOOL options

Using SPOOL

You can list or change spooler assignments, as summarized in the chart below. Spooler assignments are necessary for the NPRINT and CAPTURE commands to function properly. In addition, NetWare v2.*xx* maintains compatibility with NetWare v2.0a by automatically redirecting spool jobs supported by NetWare v2.0a to the appropriate queue and printer.

If you create new print queues, you may also create new spooler assignments for those queues.

You can also create assignments and store them in the AUTOEXEC.SYS file. (See SYSCON.)

SPOOL command	Function
S[POOL]	Lists spooler assignments. No assignments will be listed until you have made a spooler assignment using the command explained below.
S[POOL] *nn*TO QUEUE *queue_name*	Sets up a spooler assignment. Replace *nn* with a spooler number (0 to 5). All print jobs spooled to spooler *nn* will be sent to the specified queue and printed by the printer servicing the specified queue.

SYSCON

Use SYSCON to control accounting, file server, group, and user information. As supervisor, you can also control the network activities of Workgroup Managers.

Command format

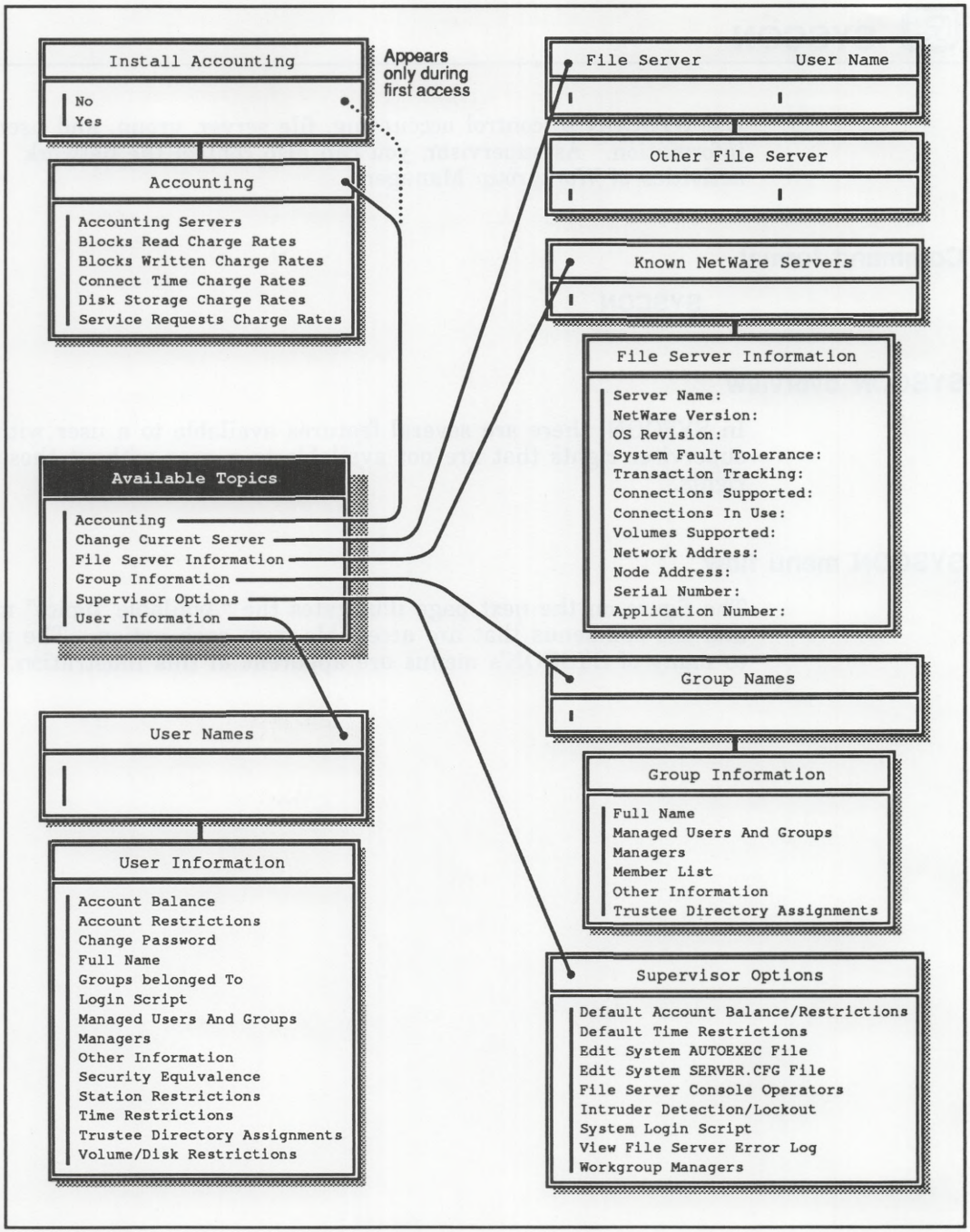
SYSCON

SYSCON overview

In SYSCON, there are several features available to a user with supervisor rights that are not available to a user without those rights.

SYSCON menu flow

The figure on the next page illustrates the "Available Topics" menu and the submenus that are accessible from each option. The paths to many of SYSCON's menus are apparent in this illustration.



SYSCON Overview

Choose from the topics on the menu flow. For further help, see the specific tasks described below. A quick path precedes each screen. Additional information about menu items is available by pressing <F1> for on-line help.

Accounting

The accounting feature must be installed in order to use that option. For more information, see "Managing accounting" on page 145.

Assign charge rates.

The SUPERVISOR can choose to charge rates for blocks read, blocks written, connect time, disk storage, or service requests. The following example shows the blocks read options, but the same steps are applicable to the other charge features.

Enter SYSCON and follow this path.

"Accounting" ↵ "Blocks read charge rate" ↵

```
Blocks Read Charge Rates          Sun Mon Tue Wed Thu Fri Sat
                          8:00am   1   1   1   1   1   1   1
                          8:30am   1   1   1   1   1   1   1
                          9:00am   1   1   1   1   1   1   1
Sunday                    9:30am   1   1   1   1   1   1   1
8:00 am To 8:29 am       10:00am   1   1   1   1   1   1   1
                         10:30am   1   1   1   1   1   1   1
Rate Charge  Rate Charge 11:00am   1   1   1   1   1   1   1
 1  No Charge 11         11:30am   1   1   1   1   1   1   1
 2            12         12:00pm   1   1   1   1   1   1   1
 3            13         12:30pm   1   1   1   1   1   1   1
 4            14          1:00pm   1   1   1   1   1   1   1
 5            15          1:30pm   1   1   1   1   1   1   1
 6            16          2:00pm   1   1   1   1   1   1   1
 7            17          2:30pm   1   1   1   1   1   1   1
 8            18          3:00pm   1   1   1   1   1   1   1
 9            19          3:30pm   1   1   1   1   1   1   1
10            20          4:00pm   1   1   1   1   1   1   1
   (Charge is per block)   4:30pm   1   1   1   1   1   1   1
```

File server information

Enter SYSCON and follow this path.

"File Server Information" ↵ *(Select file server)* ↵

```
File Server Information

Server Name:
NetWare Version:
OS Revision:
System Fault Tolerance:
Transaction Tracking:
Connections Supported:
Connections in Use:
Volumes Supported:
Network Address:
Node Address:
Serial Number:
Application Number:
```

Group information

Some of the "Group Information" options include creating and modifying groups, managers, managed users, and assigning or modifying group rights.

Trustee directory assignments

Enter SYSCON and follow this path.

"Group Information" ↵ *(Select a group name)* ↵ "Trustee Directory Assignments" ↵

```
Trustee Directory Assignments

SYS:LOGIN                [ R      F ]
SYS:MAIL                 [  WC     ]
```

Supervisor options

"Supervisor Options" includes such tasks as setting up and modifying account balances, creating and modifying the system login script, and creating or modifying an AUTOEXEC.SYS file.

Set account balances and restrictions

Enter SYSCON and follow this path.

"Supervisor Options" ↵ "Default Account Balance/Restrictions" ↵

```
Default Account Balance/Restrictions

Account Has Expiration Date:                No
   Date Account Expires:
Limit Concurrent Connections:               No
   Maximum Connections:
Create Home Directory for User:             Yes
Require Password:                           No
   Minimum Password Length:
Force Periodic Password Changes:
   Days Between Forced Changes:
   Limit Grace Logins:
      Grace Logins Allowed:
Require Unique Passwords:
Account Balance:                            234
Allow Unlimited Credit:                     Yes
   Low Balance Limit:
Limit Server Disk Space:                    No
Maximum Server Disk Space (KB):
```

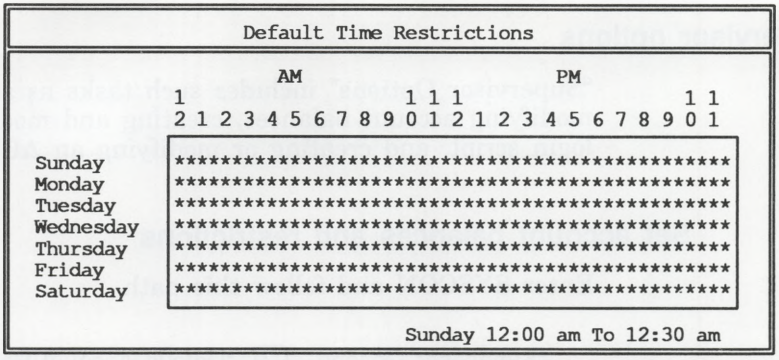
The "Limit Server Disk Space" and "Maximum Server Disk Space" fields only appear if you specified to limit disk space for users during installation.

For detailed information on planning for and assigning charge rates, see "Managing accounting."

Assign time restrictions

Enter SYSCON and follow this path.

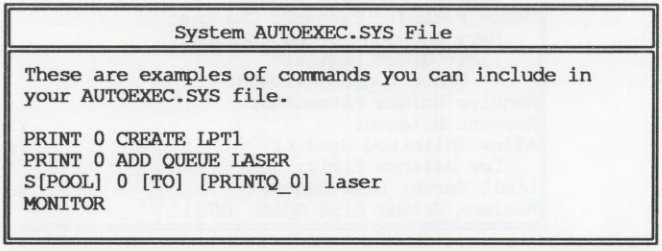
"Supervisor Options" ↵ "Default Time Restrictions" ↵



Create or modify an AUTOEXEC.SYS file

Enter SYSCON and follow this path.

"Supervisor Options" ↵ "Edit System AUTOEXEC.SYS File" ↵

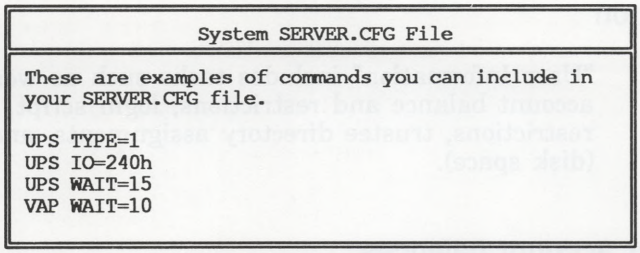

System AUTOEXEC.SYS File
These are examples of commands you can include in
your AUTOEXEC.SYS file.
PRINT 0 CREATE LPT1
PRINT 0 ADD QUEUE LASER
S[POOL] 0 [TO] [PRINTQ_0] laser
MONITOR

For an explanation of what the AUTOEXEC.SYS file is, see *Concepts*. For detailed information on creating and modifying the AUTOEXEC file, see "Managing the file server."

Create and modify SERVER.CFG File

Enter SYSCON and follow this path.

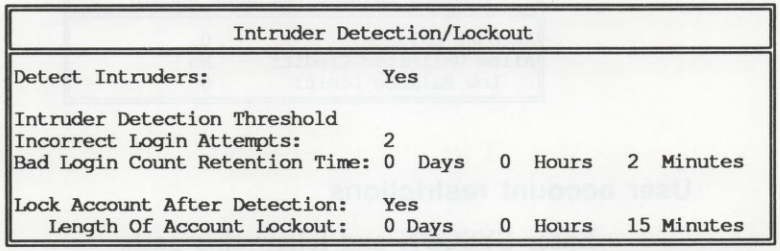
"Supervisor Options" ↵ "Edit System SERVER.CFG File" ↵



Intruder detection/lockout

Enter SYSCON and follow this path.

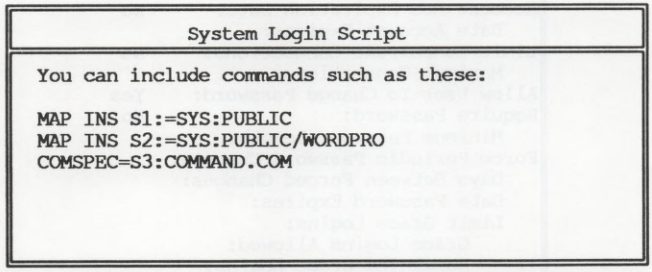
"Supervisor Options" ↵ "Intruder Detection/Lockout" ↵


Intruder Detection/Lockout
Detect Intruders: Yes
Intruder Detection Threshold
Incorrect Login Attempts: 2
Bad Login Count Retention Time: 0 Days 0 Hours 2 Minutes
Lock Account After Detection: Yes
Length Of Account Lockout: 0 Days 0 Hours 15 Minutes

Create or modify the system login script

Enter SYSCON and follow this path.

"Supervisor Options" ↵ "System Login Script" ↵



See "Logging in and out" for detailed information on planning login scripts.

User Information

"User Information" includes tasks such as working with a user's account balance and restrictions, login script, station and time restrictions, trustee directory assignments, and volume restrictions (disk space).

User account balances

Enter SYSCON and follow this path.

"User Information" ↵ "User Names" ↓↑ ↵ "Account Balance" ↵

```
Account Balance For User NELLIE

Account Balance:              0
Allow Unlimited Credit:       No
   Low Balance Limit:         0
```

User account restrictions

Enter SYSCON and follow this path.

"User Information" ↵ "User Names" ↓↑ ↵ "Account Restrictions" ↵

```
Account Restrictions For User Anne

Account Disabled:                    No
Account Has Expiration Date:         No
   Date Account Expires:
Limit Concurrent Connections:        No
   Maximum Connections:
Allow User To Change Password:       Yes
Require Password:                    No
   Minimum Password Length:
Force Periodic Password Changes:
   Days Between Forced Changes:
   Date Password Expires:
   Limit Grace Logins:
      Grace Logins Allowed:
      Remaining Grace Logins:
Require Unique Passwords:
Limit Server Disk Space:             Yes
Maximum Server Disk Space (KB):      2048
```

Login script

Enter SYSCON and follow this path.

"User Information" ↵ "User Names" ↓↑ ↵ "Login Script" ↵

```
Login Script For User KALEB

map f:=gracie/sys:home/kaleb
map g:=gracie/sys:
map h:=gracie/admin:
map i:=gracie/graphics:
map del s2:
map ins s2:=gracie/sys:appl/wp51
map ins s4:=sys:appl/123
attach turtle/kaleb
map j:=turtle/sys:
#capture q:suzy_q nb nff ti=5
```

See "Logging in and out" for an explanation of login script commands and for sample login scripts.

Other information

Enter SYSCON and follow this path.

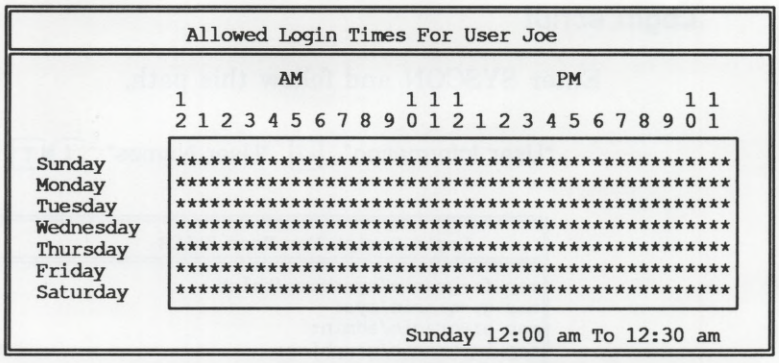
"User Information" ↵ "User Names" ↵ "Other Information" ↵

```
Last Login:                    October 24, 1990  12:50:12 pm
File Server Console Operator:  Yes
Maximum Server Disk Usage:     2,048 KBytes
Disk Space In Use:               80 KBytes
User ID:                       425B0397
```

Time restrictions

Enter SYSCON and follow this path.

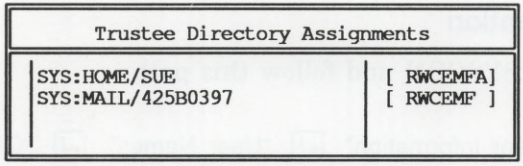
"User Information" ↵ "User Names" ↓↑ ↵ "Time Restrictions" ↵



Trustee directory assignments

Enter SYSCON and follow this path.

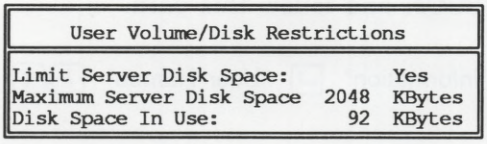
"User Information" ↵ "User Names" ↓↑ ↵ "Trustee Directory Assignments" ↵



Volume/disk restrictions

Enter SYSCON and follow this path.

"User Information" ↵ "User Names" ↓↑ ↵ "Volume/Disk Restrictions" ↵


User Volume/Disk Restrictions
Limit Server Disk Space: Yes
Maximum Server Disk Space 2048 KBytes
Disk Space In Use: 92 KBytes

SYSTIME

Use SYSTIME to view the date and time set on any file server on your network or internetwork. SYSTIME also synchronizes the date and time set on your workstation with the settings on that file server.

Command format

SYSTIME [fileserver]

Using SYSTIME

- SYSTIME is placed in SYS:PUBLIC during installation.
- Consider placing SYSTIME in the system login script or in individual login scripts for users who log in from workstations that need the date and time set every time they boot.

Related commands

SET TIME
TIME

TIME

Use TIME to display the date and time kept by the file server's clock.

Command format

TIME

Using TIME

- TIME is coded into the file server operating system.
- To change the file server's date or time, use SET TIME.

Related commands

SET TIME
SYSTIME

TLIST

Use TLIST to view the trustee list of a directory or a file on a file server you are attached to.

Command format

TLIST [path [USERS|GROUPS]]

Using TLIST

- TLIST is placed in SYS:PUBLIC during installation.
- TLIST supports wildcard characters. To view only the user trustees of a directory, include USERS. To view only the group trustees, include GROUPS. If you do not specify either USERS or GROUPS, both will be displayed.
- If you want to view the trustee list for the default directory, use a period (.) in place of *path* to represent the default directory. Use two periods (..) to display the trustee lists of the directory above the current directory. Include a space before and after the period(s).

Related commands

FILER (Current Directory Information)
GRANT
REMOVE
REVOKE
RIGHTS
SYSCON (Group Information, User Information)

TRACK OFF

Use TRACK OFF to turn off the display of network advertising packets that are received or sent.

Command format

TRACK OFF

Using TRACK OFF

- TRACK OFF is coded into the file server operating system and ROUTER.EXE.
- When you are not using the tracking feature, use TRACK OFF and OFF to free up a little operating system overhead.

Related commands

OFF
TRACK ON

TRACK ON

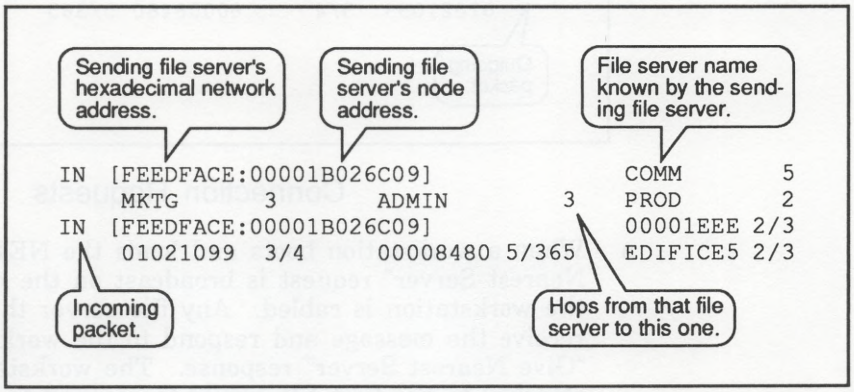
Use TRACK ON to display network advertising packets that are received or sent.

Command format

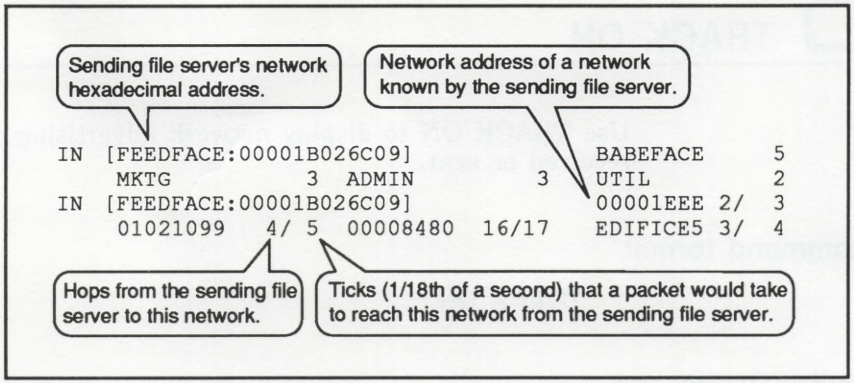
TRACK ON

Using TRACK ON

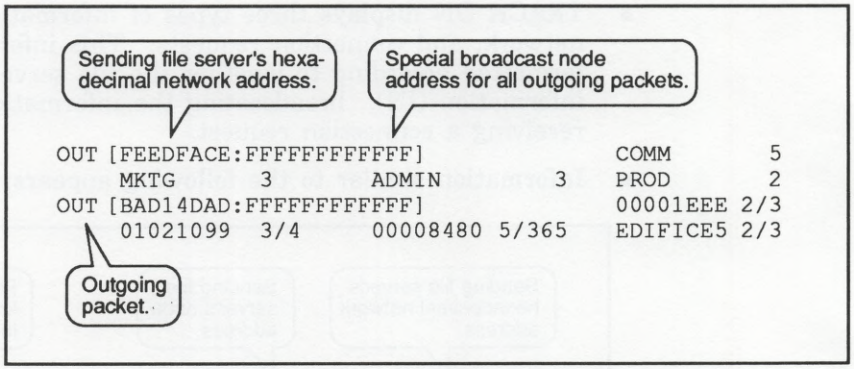
- TRACK ON is coded into the file server operating system and ROUTER.EXE.
- TRACK ON displays three types of information: server, network, and connection requests. This information is formatted according to whether the file server is receiving the information (IN), broadcasting the information (OUT), or receiving a connection request.
- Information similar to the following appears:


Sending file server's hexadecimal network address.
Sending file server's node address.
File server name known by the sending file server.
IN [FEEDFACE:00001B026C09] COMM 5
MKTG 3 ADMIN 3 PROD 2
IN [FEEDFACE:00001B026C09] 00001EEE 2/3
01021099 3/4 00008480 5/365 EDIFICE5 2/3
Incoming packet.
Hops from that file server to this one.

Server Information


Sending file server's network hexadecimal address.
Network address of a network known by the sending file server.
IN [FEEDFACE:00001B026C09] BABEFACE 5
MKTG 3 ADMIN 3 UTIL 2
IN [FEEDFACE:00001B026C09] 00001EEE 2/ 3
01021099 4/ 5 00008480 16/17 EDIFICE5 3/ 4
Hops from the sending file server to this network.
Ticks (1/18th of a second) that a packet would take to reach this network from the sending file server.

Network Information


Sending file server's hexadecimal network address.
Special broadcast node address for all outgoing packets.
OUT [FEEDFACE:FFFFFFFFFFFF] COMM 5
MKTG 3 ADMIN 3 PROD 2
OUT [BAD14DAD:FFFFFFFFFFFF] 00001EEE 2/3
01021099 3/4 00008480 5/365 EDIFICE5 2/3
Outgoing packet.

Connection Requests

- When a workstation boots and loads the NETx file, a "Get Nearest Server" request is broadcast on the network to which the workstation is cabled. Any file server that is connected can receive the message and respond to the workstation with a "Give Nearest Server" response. The workstation initially attaches to the first file server to respond to the "Get Nearest Server" request.
- When you are not using the tracking feature, use TRACK OFF and OFF to free up a little operating system overhead.

Related commands

DISPLAY NETWORKS
DISPLAY SERVERS
RESET ROUTER
TRACK OFF

UNMIRROR

Use UNMIRROR on a dedicated file server to turn off its mirroring feature and then shut down a drive. When you unmirror a drive, the other drive in the mirrored pair will continue to function normally under Hot Fix, but will not be protected by mirroring or duplexing.

Command format

UNMIRROR nn

Using UNMIRROR

- UNMIRROR is coded into the dedicated file server operating system.
- Make sure all users are logged out (use BROADCAST and DISABLE LOGIN).
- For example, deactivate the mirroring or duplexing feature on drive 01 by typing

  UNMIRROR 01 <Enter>

  Each drive pair requires a separate command. Use REMIRROR to remove it.
- If you reboot the file server while the drive is unmirrored, all data on the functioning drive will be copied to the restored drive. If the file server was not rebooted while the failed drive was unmirrored, only the data that changed will be copied to the restored drive when you REMIRROR.
- Use DISK to see the drive number of each drive and view the status of each disk before and after you use UNMIRROR. See DISK for more information.

Related commands

BROADCAST
CLEAR STATION
DISABLE LOGIN
DISK
ENABLE LOGIN
MONITOR
REMIRROR

UPS

Use UPS to view the status of an uninterrupted power supply.

Command format

UPS

Using UPS

- UPS is coded into the file server operating system.
- UPS indicates if an uninterrupted power supply is enabled, on-line, or running the server. The operating system broadcasts a warning message to all stations and the error log when the commercial power fails or is restored.

USERDEF

Use USERDEF to

- Create multiple users;
- Provide simple login scripts;
- Set up home directories;
- Set up minimal login and password security;
- Assign account and disk space restrictions;
- Set up print job configurations.

Command format

USERDEF

Preparing to run USERDEF

Note: You need SUPERVISOR or workgroup manager rights to use USERDEF.

Before you run USERDEF, you must complete some preliminary steps, depending on whether you use the default template or a custom template.

Default template. If you use the default template, do the following:

- Install the accounting option in SYSCON (if you will use accounting).
- Copy print device definitions for your printers with PRINTDEF.
- Create print job configurations in PRINTCON for user SUPERVISOR so the configurations can be copied for new users.

Custom template. If you use a custom template, do the following:

- Install the accounting option in SYSCON (if you will use accounting).
- Create user groups in SYSCON (if you need groups other than EVERYONE).

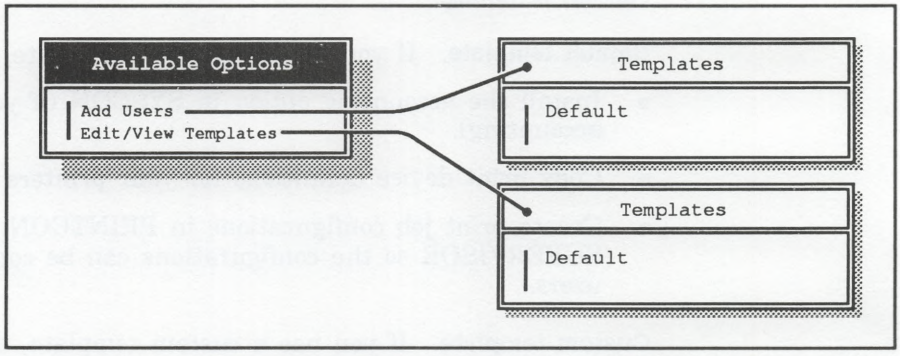
- Create application directories (if you are not putting program files in SYS:PUBLIC).
- Create a parent directory for users' home directories (if you don't want them directly in the SYS volume).
- Erase the home directory field to override the default directory path in the SYS volume (if you don't want users to have a home directory).
- Copy print device definitions with PRINTDEF.
- Create print job configurations in PRINTCON for user SUPERVISOR so the configurations can be copied for new users.

Note: You need DOS or OS/2 loaded on your file server to use USERDEF. If you have not loaded DOS, USERDEF prompts you to insert the DOS diskettes and uploads DOS to your server.

If you upload DOS v3.30 from 3.5-inch diskettes, the STARTUP and OPERATING files are combined on a single diskette. In this case, press <Esc> when prompted to insert the *OPERATING* diskette. You do not need to remove the diskette and reinsert it.

USERDEF menu flow

The figure below illustrates the "Available Options" menu and submenus that are accessible from each option.



Using USERDEF

The sections that follow present menus and screens accessed through the "Available Options" menu. A quick path precedes each

screen. To see additional information about menu items, press <F1> for online help.

Add users

Enter USERDEF and follow this path.

"Add Users" [↵] [↓][↑] [↵] [Ins] *(Type full name of user you are creating)* [↵] *(Accept or edit the user's login name)* [↵] *(Repeat the above two steps to add multiple users)* [Esc] [Y] [↵]

After the password has been specified for each new user, USERDEF creates the new users. USERDEF creates a .USR file that is processed by MAKEUSER. You are asked to wait while the file is scanned and processed. Errors encountered during the processing are indicated on the "MakeUser Results" screen that appears when the processing is complete.

Create a custom template for USERDEF

To create a custom template for creating users, you should edit the template parameters, edit the basic login script, or both.

Edit the template's account parameters

Enter USERDEF and follow this path.

"Edit/View Template" [↵] [Ins] *(Type the name of the template to create)* [↵] "Edit Parameters" [↵] [↓][↑] [↵]

```
        Parameters for Template CLERK

Default Directory:  SYS:
Copy PrintCon From: (see list)
Groups Belonged To: (see list)
Account Balance:                    1000
Limit Account Balance:              No
      Low Limit:
Limit Concurrent Connections:       No
      Maximum Connections:

Require Password:                   Yes
      Minimum Password Length:      5
Force Periodic Password Changes:    Yes
      Days Between Forced Changes:  90
Require Unique Passwords:           Yes
```

For an explanation of the parameters, press <F1> (Help).

Edit the basic login script

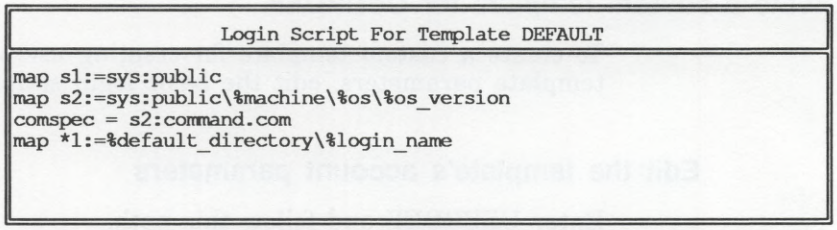
The basic login script in the default template is intended as a starting point. Do not change the drive mappings and COMSPEC command in the basic login script. They are needed to give users access to their home directories, the DOS directories, and the commands and utilities in SYS:PUBLIC.

You can, however, add mappings. Add a search drive mapping to any application subdirectory you have created.

For a list of other login script commands and explanations of what they do and how to use them, see "Logging in and out."

Enter USERDEF and follow this path.

"Edit/View Template" ↵ ↓↑ ↵ "Edit Login Script" ↵



A window appears displaying the login script from the default template. Add a search drive mapping to each application subdirectory you created. For example, if you created SYS:PUBLIC/WP for a word processing application, type (on the line following the last search drive mapping)

MAP INS S3:=SYS:PUBLIC/WP

Do not use the same search drive number for more than one subdirectory.

Then follow this path.

(Enter additional commands you want) (Press Esc ↵ Esc ↵ *until you exit USERDEF)*

Restrict disk space for existing users

Use this USERDEF option to restrict disk space at the volume level for existing users.

Enter USERDEF and follow this path.

"Restrict User" [↵] [↓][↑] [↵] "User Disk Space Limitation Information" [↵] "Limit Space" [Y] [↵] "Available Kilobytes" *(Enter maximum disk space to allow)* [Esc]

USERLIST

Use USERLIST to view a list of current users for any file server to which you are attached. You can view each user's

- Connection number;
- Login time;
- Network address and node address;
- Object type attached to the file server.

Command format

USERLIST [fileserver/][name] [/option...]

Using USERLIST

- USERLIST is placed in SYS:PUBLIC during installation.
- The following chart explains USERLIST's options.

Option	Description
/Address	Displays the network and node addresses along with the connection number and login time.
/Object	Displays the object type along with the connection number and login time.
/Continuous	Displays the list of users without any scrolling pauses.

- An asterisk (*) appears next to your username in the list of current users.
- USERLIST supports wildcard characters; USERLIST without options lists all users who are logged in.

Related commands

SESSION (User List)
SYSCON (User Information)

VAP

Use VAP to view a list of value-added processes (VAPs) that are loaded onto the NetWare operating system and their commands.

Command format

VAP

Using VAP

- VAP is coded into the file server operating system and ROUTER.EXE.
- VAP displays a list of all loaded VAPs, and any console commands that each VAP recognizes.

VER

Use VER to view the file server's operating system version information.

Command format

VER

Using VER

- VER is coded into the file server operating system.
- Enter the VER command and the file server's operating system version will be displayed.

Related commands

FCONSOLE (Version Information)
SYSCON (File Server Information)

VERSION

Use VERSION to view a NetWare .EXE file's software version, copyright information, and checksum.

Command format

VERSION [path] filename

Using VERSION

- VERSION is placed in SYS:PUBLIC during installation.
- The .EXE extension is not required at the command line.

VOLINFO

Use VOLINFO to view information about each volume on your file server.

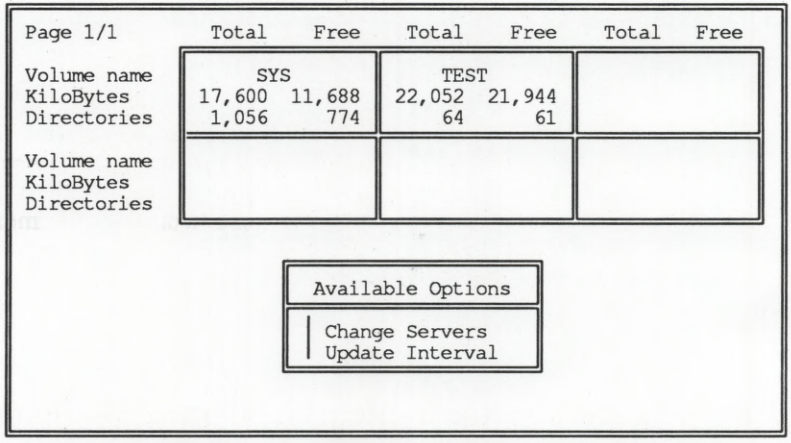
Command format

VOLINFO

Using VOLINFO

When you enter VOLINFO, you see the "View Volume Information" window. You also see an "Available Options" menu from which you can

- Change to a different file server;
- Update the interval.



VOLINFO displays information for up to 32 volumes. Each DOS file, subdirectory, and trustee list on the volume uses one directory entry. Each Macintosh file uses two directory entries.

VREPAIR

Use VREPAIR to correct minor hard disk problems without destroying the data on the disk, and to locate and add new bad blocks to a disk's Bad Block table.

Command format

VREPAIR

Using VREPAIR

- VREPAIR is found on the *SYSTEM-2* diskette and placed in SYS:SYSTEM during installation.
- VREPAIR affects only those volumes you specify.
- If the file server is already installed and running, you must down the file server before you can run VREPAIR.

How to run VREPAIR

VREPAIR corrects directory and File Allocation Table (FAT) problems arising from defective media or unexpected power loss. These problems are indicated by various error messages, both at the file server console and at the workstation monitors. If you are experiencing major problems and must reformat a network hard disk, use COMPSURF.

Down the file server

1. Make sure all network users have closed their data and application files and have logged out.
2. Use the DOWN command from the file server console (or from a workstation using FCONSOLE).
3. If you have attached external hard disks to the file server, make sure they are turned on and have had at least 30 seconds to spin up to speed.
4. Reboot the file server with DOS.
5. Insert your working copy of the *SYSTEM-2* diskette (installation should have linked and configured the VREPAIR file first).

6. At the DOS prompt, type

   VREPAIR <Enter>

   Information similar to the following appears:

```
    NetWare VRepair V2.xx
(c)Copyright Novell, Inc. 1985, 1987, 1990

191 Cache Buffers

Drive: 1. IBM AT Hard Disk "C"    type 014
Drive: 2. Vertex V185/A4070
Drive: 3. Vertex V185/A4070

Select Drive Number ? _
```

   Mirrored or duplexed disk drives appear in the list as a single drive. VREPAIR checks the volume information on the primary drive. Then VREPAIR looks for and reports any mirroring mismatches between the two mirrored drives. A mismatch occurs when data on one disk in a mirrored pair is not matched by the same data on the other disk in the pair.

Select the disk drive and volume

1. Type the number corresponding to the drive that contains the volume you need to fix. Then press <Enter>. A prompt similar to this appears on the file server screen:

```
Drive 1 contains the volumes:

1. SYS
2. VOL1

Select the Volume ? _
```

2. Type the number corresponding to the volume you want to fix and press <Enter>.

If the drive you chose does not contain the volume you want to fix, press <Enter> to return to the previous menu. Repeat Steps 1 and 2 to select the correct drive and volume.

Specify the VREPAIR parameters

Once you have identified the volume you want to fix with VREPAIR, you must specify the following:

- Whether to print a report of any errors and corrections made
- Whether to test the volume for bad blocks
- Whether to recover "lost" blocks (blocks that are not identified in the FAT as part of a file) as separate files.

Print a report of errors. After you select the disk drive and volume, you see this message:

```
Do you want a printed report of any errors and corrections made [Yes or
No] ?
```

If a printer is attached to LPT1 of the file server, answer "Yes" to this prompt. Then you will have a printed copy of the error report generated by VREPAIR. If no errors are found, no error report will be printed.

Before you can print an error report, VREPAIR requires that you have a printer connected as network printer 0. If you do not have a printer connected as printer 0, follow the instructions under PCONSOLE.

Test the volume for bad blocks. The next message you see is this:

```
Do you want to test for Bad Blocks [Yes or No] ?
```

If you received "write error" messages indicating that you had unmarked bad blocks, you should answer "Yes" to this prompt. You can answer "Yes" and test for bad blocks even if bad block errors have not been indicated; however, testing for bad blocks may increase the overall testing time needlessly.

Recover "lost" blocks as separate files. After you answer the second prompt, you see this prompt:

```
Do you want to recover lost blocks as files [Yes or No] ?
```

A "lost" block is one that is not identified in the FAT as part of an existing file. If the FAT has been corrupted or if the file server was brought down while a file was open, you can rebuild most of the file by piecing together the recovered blocks.

If you want to recover lost blocks as files, answer "Yes." Answer "No" if you want any lost blocks to be erased.

Confirm your choices. When you have answered the three prompts for specifying VREPAIR parameters, you see a prompt like this:

```
Print Option: Enabled

Bad Block Test Option: Enabled

Recover Lost Blocks Option: Enabled

Is this Correct [Yes, No, Abort] ?
```

- To change one of the options, type "N" and press <Enter>. You return to the first VREPAIR operation parameter prompt and can reselect the options.
- To return to the Volume Selection prompt, type "A" and press <Enter>.
- To verify the selections and continue, type "Y" and press <Enter>.

Run the VREPAIR tests

Once you have confirmed the VREPAIR operation parameters, the actual VREPAIR testing begins. Messages similar to the following appear sequentially as each test is executed:

```
Checking Volume: SYS
Checking For Bad FAT Blocks
Checking For Bad Dir Blocks
Checking For Bad Data Blocks
Checking for Mirror Mismatches
Checking Directory
Checking Trustees
Checking Files
Checking Resource Forks
Purging Salvage Files
Checking Reserved FAT
Checking FAT
Recovering Lost Blocks
Checking Resource Fork Consistency
```

VREPAIR recognizes the dual file structure of Macintosh files. Each file consists of a data fork and a resource fork. VREPAIR tests Macintosh files for resource forks and for resource fork consistency.

What if VREPAIR detects errors

If VREPAIR detects errors while performing any of the tests listed above, you see a message describing the error and indicating the corrective action VREPAIR will take.

For example, suppose you specified that VREPAIR recover lost blocks as files. For each lost block detected, you see a message similar to this:

```
<------ Lost file at Slot 79 ------>

Corrected Entry follows:

File Entry
Name: VF000000.F00
Path: VOL1:
Attribute: 20   1st Fat: 13A
File Size: 4096

<------------------ end ------------------->
```

This message indicates, among other things, the filename that is assigned to the recovered block and the directory path in which that file is placed.

After each error message, a prompt similar to the following is displayed:

```
Abandon Error Report [Yes or No] ? _
```

You can type "No" to continue viewing the current sequence of error report messages, or type "Yes" to abandon the current sequence of error report messages.

When the VREPAIR tests are complete, you see

```
Make corrections permanent [Yes or No] ? _
```

Answer "Yes." While the corrections indicated in the various error report messages are being made, the console screen displays a message similar to the following:

```
Updating Vol:  VOL1
```

If no errors are found in the volume being tested, VREPAIR reports

```
No Errors in Volume: VOL1
Press return to continue
```

Start over, or exit VREPAIR

When you press <Enter> you see the volume selection prompt again. At this point, you can run VREPAIR for another volume on the current drive, or you can exit VREPAIR.

Run VREPAIR again

At the volume selection prompt, select the volume you want to fix (or enter the volume number of the volume you want to fix) on the current drive. You are asked again to select the VREPAIR operation parameters.

If the volume you want to fix is not on the current drive, press <Enter>. You are asked to select the disk drive and volume and go through VREPAIR again.

Exit VREPAIR

At the volume selection prompt, press <Enter>. Press <Enter> a second time and you see this message:

```
VRepair complete.
Power off and back on to restart.
```

Remove the *SYSTEM-2* diskette from drive A. Then turn the file server off and back on again.

After running VREPAIR

Reboot the file server.

Related commands

COMPSURF

WATCHDOG

Use WATCHDOG to monitor file server connections.

Command format

WATCHDOG [START=n] [INTERVAL=n] [COUNT=n]

Using WATCHDOG

- WATCHDOG is coded into the file server operating system.
- The start value (how long the file server waits to check a user's new connection) is specified in seconds; minimum 15, maximum 1,200 (20 minutes), and default 300 (5 minutes).
- The interval value is specified in seconds; minimum 1, maximum 600 (10 minutes), and default 60 (1 minute).
- The count value is specified in the number of intervals after start before clearing an active connection; minimum 5, maximum 100, default 10.
- Consider placing WATCHDOG in your file server's AUTOEXEC.SYS file for automatic implementation.

Related commands

MONITOR

WHOAMI

Use WHOAMI to view the following information about the file servers you are attached to:

- Your username on attached file servers
- The names and software versions of attached file servers
- Your login date and time for attached servers
- Your rights and groups you belong to on attached servers
- Your security equivalences on attached servers

Command format

WHOAMI [fileserver] [option...]

Using WHOAMI

- WHOAMI is placed in SYS:PUBLIC during installation.
- The following chart explains WHOAMI's options. Leave a space before and after each option in the command.

Option	Description
/Security	Displays your security equivalences on each file server you specify.
/Groups	Displays your membership in groups on each file server you specify.
/Workgroup	Displays workgroup manager information.
/Rights	Displays your effective rights on each file server to which you are attached.
/SYstem	Displays general system information.
/Object	Displays object supervisor information as well as the users and groups being supervised.
/All	Displays all the information available with the other options: your group membership, your security equivalences, your effective rights, Object Supervisor, Workgroup Manager, and general system information.

WSUPDATE

Use WSUPDATE to update workstation files from the file server. WSUPDATE can be used to update workstation copies of the NetWare shell program or other files. WSUPDATE compares the date and time of the source file with the date and time of the destination file. If the source file is more current than the destination file, the utility will update the destination file.

WSUPDATE can be used to update files on any drive from more recent files on another drive. For example, if you have an internal document that you want all users to have current copies of, you can use WSUPDATE to ensure that users have current copies.

Command format

WSUPDATE [source path] [destination drive:destination filename] /option

Using WSUPDATE

Replace *source path* with a full directory path (including the filename) to the current file.

Replace *destination drive* with a specific drive (A:, B:, C: etc.) or one of the following:

ALL: to search all valid drives for the workstation.

ALL_LOCAL: to search all valid local drives for the workstation.

Replace *destination filename* with the name of the file to be updated.

Replace */option* with any of the following options. (Only one of /I, /C, or /R can be used.)

/F=<path><filename> Add this option if the commands are going to come from a file. Type commands into this file as if you were typing them from the command line. Each command will be interpreted separately. If errors are found in one command, the program will display and log an error and then continue on to the next command line. This must be the only parameter on the command line.

/I This is the default option. The /I option forces the utility to prompt you for an action each time it finds an outdated file. You will be able to

- Copy the new file over the old file.
- Rename the old file and then copy a new file. You will be prompted for a file name for the renamed file.
- Ignore the new copy and leave the old file intact.

/C Add this option to automatically copy a new file over an existing one. (This option is not recommended since there is no backup file in case you want to undo the copy.) If you do not enter /C or /R then /I will be used by default.

/R Rename the old file (with a .OLD extension) and then copy the new file. If you do not enter /C or /R then /I will be used by default.

/S Add this option if you want the program to search for the outdated files in all subdirectories of the specified destination drives.

/L=<path><filename> Add this option if you want a Log File to be created. The messages will be added to whatever is already in the file. You must have Read and Write rights to this file.

The following is a sample log file:

```
    SHIRLEY  11/26/1990  11:21:29
Network: [FADE2220]  Node: [    1B30D6F7]
Rename a file
    From path C:\UTIL
    to path C:\UTIL
    STUFF      to  STUFF.OLD
Copy a file
    From path SERVER1\SYS:USERS\SHIRLEY\DIR1
    to path C:\UTIL
    STUFF      to      STUFF
Rename a file
    From path C:\DIR1
    to path C:\DIR1
    STUFF      to  STUFF.OLD
Copy a file
    From path SERVER1\SYS:USERS\SHIRLEY\DIR1
    to path C:\DIR1
    STUFF      to      STUFF
Rename a file
    From path C:\TEMP
    to path C:\TEMP
    STUFF      to  STUFF.OLD
Copy a file
    From path SERVER1\SYS:USERS\SHIRLEY\DIR1
    to path C:\TEMP
    STUFF      to      STUFF

Source File: SERVER1\SYS:USERS\SHIRLEY\DIR1
Destination File: C:STUFF
```

```
Copies Found:      3
Copies Outdated:   3
Copies Updated:    3
```

/O Add this option if you want to update Read-only files. Often, shell files have the Read-only attribute set. If this is the case, you will want to add this option so that these files will be updated. The Read-only attribute will be restored after the copy if performed.

Additional information

Use the EXTERNAL PROGRAM EXECUTION (#) with WSUPDATE.EXE in a login script if you want the LOGIN utility to execute a command to update workstation files. We recommend that the WSUPDATE command be added to the system login script.

Add the #WSUPDATE command to a login script after copying the updated files to a common directory (such as PUBLIC).

The following restrictions apply:

- The command statement must appear on its own line.
- The command should appear after MAP assignments, since the program will execute in the environment of drive mappings, default drives, and search drives set up previously in the login script.

Update NETx.COM for workstations

Suppose a supervisor wants to update the NET3.COM file for all workstations. Place the following line in the system login script:

```
#WSUPDATE SYS:PUBLIC\NET3.COM ALL_LOCAL:NET3.COM
/L=SYS:PUBLIC\WSUPDATE.LOG /S
```

Note: The log file (WSUPDATE.LOG in the example) must be flagged Read Write. All users must have Read and Write rights to this file.

Update all shell files on the network

Suppose a supervisor wants all of the shell files for each workstation on the network to be checked weekly to make sure all users have the most current version. To automate this process, complete the following:

1. Copy the new workstation shell files into a common directory (such as PUBLIC).

2. Create a file containing all of the update paths (destination and source) like the one shown below. For this example, we will name the file WSUPDATE.CFG and enter these #WSUPDATE commands into the file:

```
F:NET3.COM C:NET3.COM
F:IPX.COM  C:IPX.COM
F:IPX.EXE  C:IPX.EXE
```

3. Enter the following command to the login script. You are replacing the destination and source paths with the name of the file containing all of the paths.

```
If Day_Of_Week = 2, run #WSUPDATE /F=WSUPDATE.CFG
```

Login Scripts Worksheet for File Server _____

System Login Script

rem *preliminary commands (optional)*

rem *greeting (optional)*

rem *display login messages (optional)*

rem *attach to other file servers (optional)*

rem *NetWare utilities mappings*

```
MAP INS S1: = SYS:PUBLIC
```

rem *DOS directory mapping and COMSPEC*

```
MAP INS S2: =
COMSPEC   = S2:COMMAND.COM
```

rem *application directory mappings*

rem *miscellaneous search drives (optional)*

rem *supervisor mappings*

rem *preliminary commands (optional)*

```
IF "%LOGIN_NAME" = "SUPERVISOR" THEN
```

rem *home or username directory mapping*

rem *work directory mapping (optional)*

rem *default printer mappings or printing batch files (optional)*

rem *display directory path at prompt*

```
SET PROMPT = "$P$G"
```

rem *display all current drive settings (optional)*

```
MAP DISPLAY ON
MAP
```

rem *run miscellaneous programs*

Basic User Login Script for _____ Group _____ Workgroup _____

rem *set environmental variables*

rem *individual drive mappings*

Basic User Login Script for _____ Group _____ Workgroup _____

rem *set environmental variables*

rem *individual drive mappings*

Directories Worksheet for File Server _____

Directory Structure					Files	File Attributes	Maximum Rights Mask	Directory Attributes
Volume:	Directory	/Subdirectory	/Subdirectory	/Subdirectory	(Source)		(Applies only to the contents of this directory)	(None automatically flagged)
SYS	*LOGIN*				*login files (copied in at installation)*	*automatically flagged*	[R W C E M F A]	
	MAIL	*subdirectory for each user created automatically*				*automatically flagged*	[R W C E M F A]	
	SYSTEM	*subdirectory for queue created automatically*			*system files (copied in at installation)*	*automatically flagged*	[R W C E M F A]	
	PUBLIC				*public files (copied in at installation)*	*automatically flagged*	[R W C E M F A]	
		DOS Directories			*user must copy files from DOS diskettes*	*user must flag ROS*	[R W C E M F A]	
		Machine name (user must create)	*Operating system MSDOS*	*DOS version*				
	HOME				*user created*	*user defined*	[R W C E M F A]	

For use with the NetWare v2.2 *Using the Network* manual.

Trustee Directory Security Worksheet for File Server _____

Directories (To be used in conjunction with Directories Worksheet)	Trustee Directory Rights to Be Assigned to Groups or Individual Users (Possible trustee rights: Read, Write, Create, Erase, Modify, File Scan, Access Control)						
USER OR GROUP NAME →	*EVERYONE*						
SYS:LOGIN	*[ ]*						
MAIL	*automatically assigned [W C]*						
SYSTEM	*no rights*						
PUBLIC	*automatically assigned [R F]*						
PUBLIC DOSDirectories	*[R F]*						

For use with the NetWare v2.2 *Using the Network* manual.

User Defaults for File Server_____ Workgroup _____

Account has expiration date? ❑ Yes ❑ No Date account expires: _____

Allow unlimited credit? ❑ Yes ❑ No Low balance limit: _____

Limit concurrent connections? ❑ Yes ❑ No Maximum concurrent connections: _____

Intruder Detection/Lockout? ❑ Yes ❑ No Intruder Detection Threshold _____
(number of incorrect login attempts permitted)
Bad login count retention time: Days:__Hours:__Min:___
(time duration after last incorrect login)

Lock account after detection? ❑ Yes ❑ No How long? Days:__Hours:__Min:___

Create Home directory? ❑ Yes ❑ No

Require password? ❑ Yes ❑ No Minimum password length: _____

Force periodic change? ❑ Yes ❑ No Days between forced password changes: _____

Require unique password? ❑ Yes ❑ No

Limit grace logins? ❑ Yes ❑ No Number of grace logins allowed: _____

Install Accounting? ❑ Yes ❑ No Initial account balance: _____

Unlimited credit? ❑ Yes ❑ No Low balance limit: _____

Limit disk space? ❑ Yes ❑ No KB: _____

Time Restrictions

SUN	MON	TUE	WED	THU	FRI	SAT

Users Worksheet for File Server _____

Full Name	Username	Application Used	Groups	Access to Directories	Time Restrictions (If not default)	Station Restrictions (Specify network and node address)	Managed by	Operator or Manager

Group Worksheet for File Server _____ for Workgroup _____

Group Name	Basis of Group	Access to Directories	Trustee Directory Assignments	Access to Files
Full Name	Managed by			

Usernames of Members *(NetWare utilities list names alphabetically)*

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Master index

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I- *Installing and Maintaining the Network*
U- *Using the Network*

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